User's Guide™

THE MAGAZINE FOR CP/M & MS-DOS SYSTEM USERS

No. 8

$4

Accounting Packages Compared

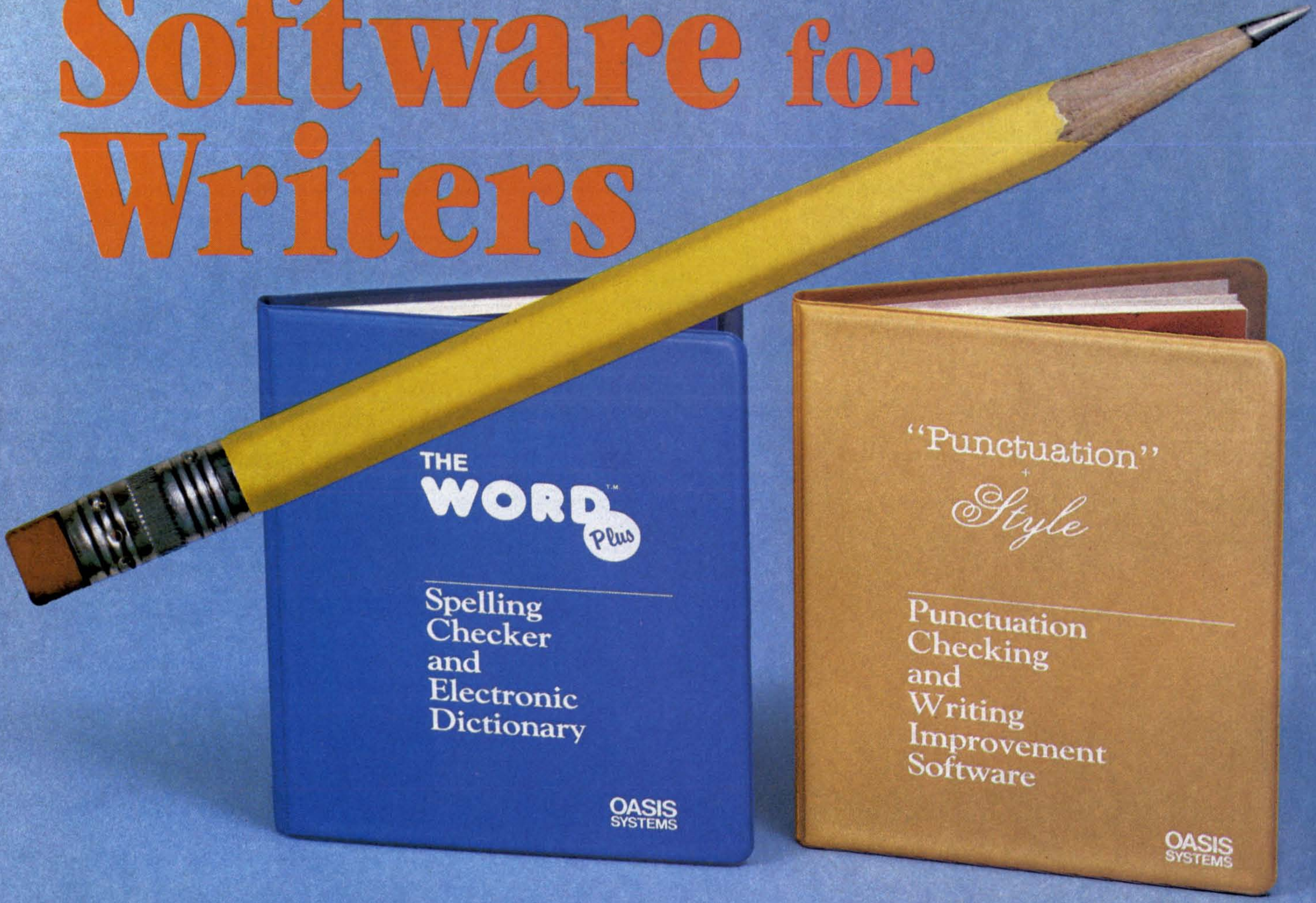
Using Mini-Ledger

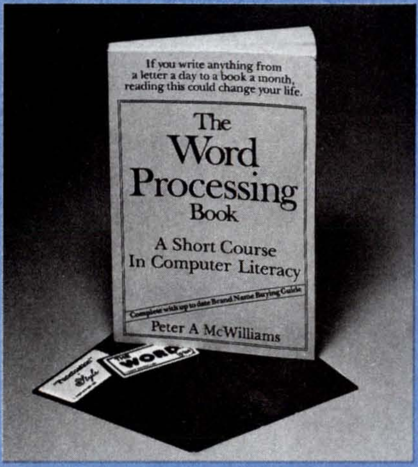
Patching With DDT

Small Business Bookkeeping

4 12 8
2 6 7
3 5 11

Software for Writers




If you write anything from a letter a day to a book a month, reading this could change your life.

The Word Processing Book

A Short Course In Computer Literacy

Complete with up-to-date Brand Name Buying Guide

Peter A McWilliams

"Oasis Systems' software — Unquestionably the best". . .

Peter McWilliams, author of the #1 best-selling book on word processing.

The WORD Plus is the standard by which other spelling checkers are measured. Here's why:

- *Real* 45,000 word dictionary.
- Shows errors "in-context."
- Interactive word look-up finds correct spelling for you and corrects at the push of a button.
- Hyphenates words automatically.
- Solves crosswords, puzzles, and anagrams.
- Works with almost any CP/M®, CP/M-86® or MS/DOS (1.0, 1.1 and 2.0) compatible word processing program (WordStar, Magic Wand (PeachText), Spellbinder, Perfect Writer, Select, Final Word, Volkswriter, . . . and more!).

Punctuation & Style takes the worry out of writing by automatically catching dozens of different punctuation errors, both common and obscure. In addition, P&S catches unpaired format commands (underline, boldface, etc.), doubled words, and more.

P&S gives you a "critique" of your writing, suggesting alternatives for commonly misused or over-worked phrases. It also shows where active voice can replace passive voice to add clarity and precision.

Punctuation & Style is the perfect companion to The WORD Plus. It works easily with most CP/M word processors. (Available soon for CP/M-86 and MS/DOS.)

Call or write for complete information: 619-222-1153

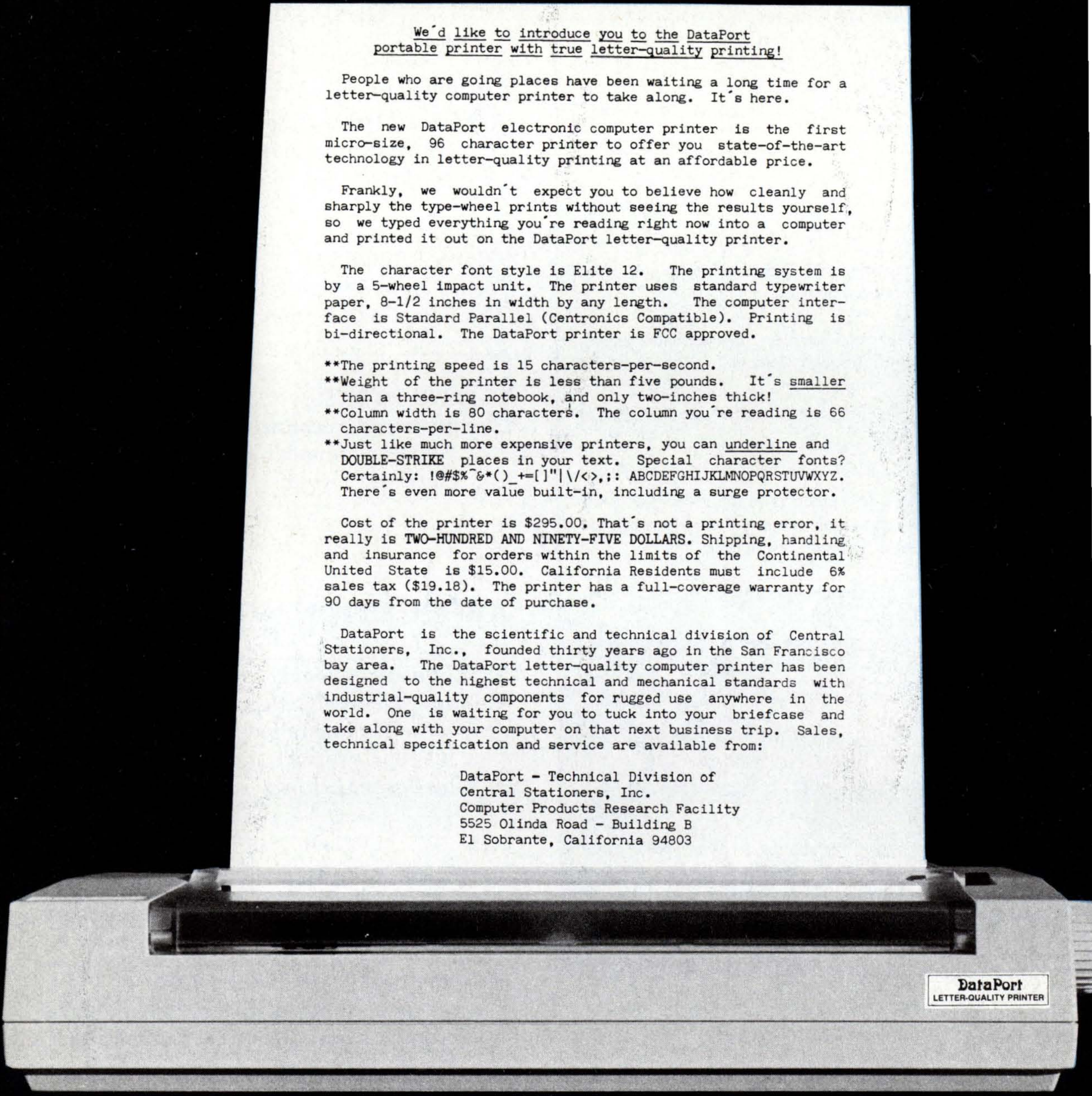
OASIS SYSTEMS

2765 Reynard Way
San Diego, CA 92103

Dealers contact:
SOFTWARE DISTRIBUTORS
1-800-252-4024 (in California)
1-800-421-0814 (outside California)

Circle number 6 on the reader service card.

CP/M and CP/M-86 are registered trademarks of Digital Research, Inc.



We'd like to introduce you to the DataPort
portable printer with true letter-quality printing!

People who are going places have been waiting a long time for a letter-quality computer printer to take along. It's here.

The new DataPort electronic computer printer is the first micro-size, 96 character printer to offer you state-of-the-art technology in letter-quality printing at an affordable price.

Frankly, we wouldn't expect you to believe how cleanly and sharply the type-wheel prints without seeing the results yourself, so we typed everything you're reading right now into a computer and printed it out on the DataPort letter-quality printer.

The character font style is Elite 12. The printing system is by a 5-wheel impact unit. The printer uses standard typewriter paper, 8-1/2 inches in width by any length. The computer interface is Standard Parallel (Centronics Compatible). Printing is bi-directional. The DataPort printer is FCC approved.

**The printing speed is 15 characters-per-second.
**Weight of the printer is less than five pounds. It's smaller than a three-ring notebook, and only two-inches thick!
**Column width is 80 characters. The column you're reading is 66 characters-per-line.
Just like much more expensive printers, you can underline and **DOUBLE-STRIKE places in your text. Special character fonts? Certainly: !@#$%^&*()_+=[]"|\/<>,;: ABCDEFGHIJKLMNOPQRSTUVWXYZ. There's even more value built-in, including a surge protector.

Cost of the printer is $295.00. That's not a printing error, it really is **TWO-HUNDRED AND NINETY-FIVE DOLLARS.** Shipping, handling and insurance for orders within the limits of the Continental United State is $15.00. California Residents must include 6% sales tax ($19.18). The printer has a full-coverage warranty for 90 days from the date of purchase.

DataPort is the scientific and technical division of Central Stationers, Inc., founded thirty years ago in the San Francisco bay area. The DataPort letter-quality computer printer has been designed to the highest technical and mechanical standards with industrial-quality components for rugged use anywhere in the world. One is waiting for you to tuck into your briefcase and take along with your computer on that next business trip. Sales, technical specification and service are available from:

DataPort - Technical Division of
Central Stationers, Inc.
Computer Products Research Facility
5525 Olinda Road - Building B
El Sobrante, California 94803

Circle number 3 on the reader service card.

User's Guide

User's Guide **Volume 2.2 (Number 8)**
May 1984

User's Guide , ISSN 0745-4791, is published six times a year by TUG, Inc., Box 5245, Redwood City, CA 94063. Second-class postage paid at Redwood City, CA 94063 (USPS 689-550).

Entire contents Copyright © 1984 by TUG, Inc. All rights reserved. Reproduction of material appearing in *User's Guide* is forbidden without explicit permission. Send all reprint requests to Reprints, User's Guide, Box 5245, Redwood City, CA 94063.

SUBSCRIPTION INFORMATION:
Single copy price $4.00 ($5.50 foreign or U.S. first-class, $10 foreign airmail). Subscription for six issues (one year) is:

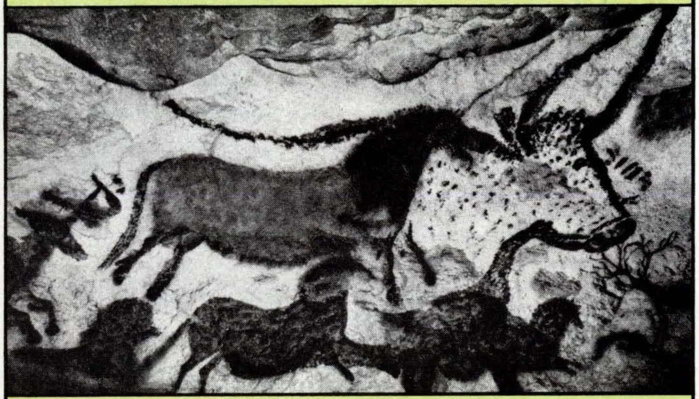
U.S. — $18 if payment accompanies order, $21 if subscription is billed (second class). Add $10 for first-class delivery.

CANADA & MEXICO — $22 in U.S. currency, payment must accompany order (second class). $32 for first-class delivery.

FOREIGN — $40 for air mail subscription. Payment (U.S. currency) must accompany foreign orders.

Inquiries about bulk, retail sale, and group rates are encouraged. Address inquiries to Circulation Dept., *User's Guide*, Box 5245, Redwood City, CA 94063. Allow 6-8 weeks for processing of order.

POSTMASTER: Please send address changes (Form 3579) to User's Guide, Box 5245, Redwood City, CA 94063.



About the Cover

The cave sculpture-paintings from the Lascaux Caves in Dordogne, France were made in the Paleolithic Age (15,000 — 10,000 BC). It is proposed that they were used as a magic ritual to ensure a successful hunt. The ritualistic painting or sculpting of animals about to be killed would somehow give the hunters a positive attitude and determination for success.

Before each new hunt, the ritual leaders would paint or sculpt new animals over the old ones already used in past rituals. Here are the earliest stages of project planning and accounting, of spreadsheets and business graphics.

Cover art by Sahnta Pannutti.

Contents...

ON PUBLISHING...
Feedback **4**

EDITORIAL...
Are CP/M Users Dropouts? **6**
CP/M users feel like second-class citizens in IBM world.

SHOW REPORT...
Scenes From Softcon and
The West Coast Computer Faire **72**

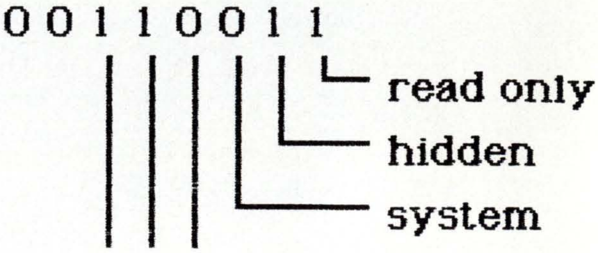
FOR STARTERS...
Computerized Accounting **7**
What to consider when putting together an accounting system.

APPLICATION NOTES

Small Business Bookkeeping:
Taranto's General Ledger **25**
How Tom installed Taranto's General Ledger for his repair service and writing business.
by Thomas Howe

OVERVIEWS

MS-DOS and PC-DOS (Part Two) **68**
An introduction to the MD-DOS/PC-DOS file storage technique from a CP/M user's point of view.
by Steve Rosenthal

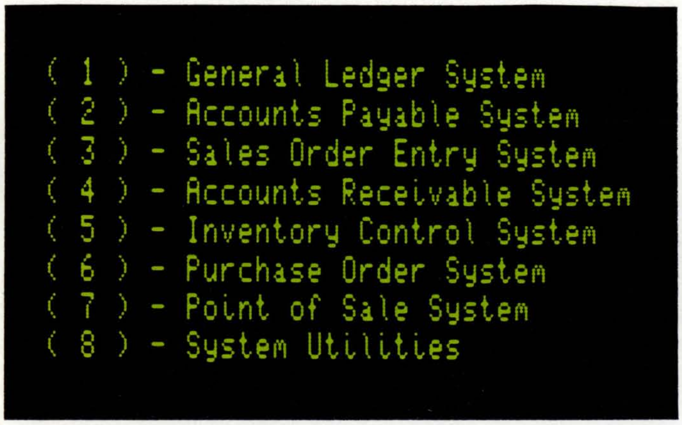


Issue 8 (Vol. 2.2)

SPECIAL

Comparing Accounting Packages
Part 1: Accounting Plus vs. SBT **55**

This first installment of a special series on accounting applications compares the receivables and inventory modules of these packages.
by Tony Bove & Cheryl Rhodes

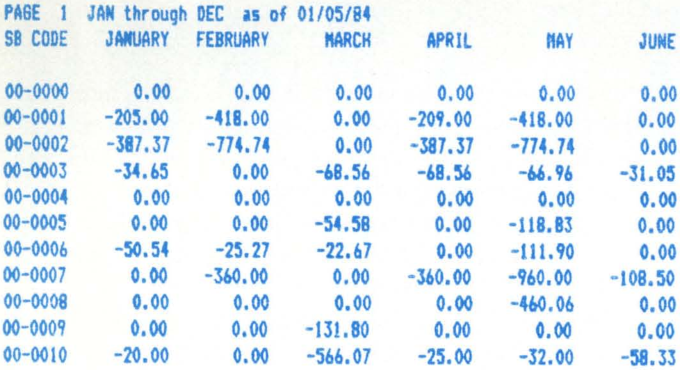


```
( 1 ) - General Ledger System
( 2 ) - Accounts Payable System
( 3 ) - Sales Order Entry System
( 4 ) - Accounts Receivable System
( 5 ) - Inventory Control System
( 6 ) - Purchase Order System
( 7 ) - Point of Sale System
( 8 ) - System Utilities
```

OPINION

Using Mini-Ledger **10**

A simple and easy-to-use accounting program for small businesses and professionals.
By Sam Perkins



```
PAGE  1  JAN through DEC  as of 01/05/84
SB CODE   JANUARY  FEBRUARY     MARCH      APRIL       MAY      JUNE

00-0000      0.00      0.00      0.00       0.00      0.00      0.00
00-0001   -205.00   -418.00      0.00    -209.00   -418.00      0.00
00-0002   -387.37   -774.74      0.00    -387.37   -774.74      0.00
00-0003    -34.65      0.00    -68.56     -68.56    -66.96    -31.05
00-0004      0.00      0.00      0.00       0.00      0.00      0.00
00-0005      0.00      0.00    -54.58       0.00   -118.83      0.00
00-0006    -50.54    -25.27    -22.67       0.00   -111.90      0.00
00-0007      0.00   -360.00      0.00    -360.00   -960.00   -108.50
00-0008      0.00      0.00      0.00       0.00   -460.06      0.00
00-0009      0.00      0.00   -131.80       0.00      0.00      0.00
00-0010    -20.00      0.00   -566.07     -25.00    -32.00    -58.33
```

TUTORIALS

Patching With DDT and SAVE **35**

Making auto-startup program disks, setting up user areas, making "patches" to programs and other powerful changes.
by Tony Bove & Cheryl Rhodes

dBASE II Tutorial (Part 2)
Part 2: Indexing & Sorting **44**

Learning how to index and sort records. Included is a command file for auto searching and appending.
by Robert Cowart

REFERENCE

ASCII Chart **34**

Hexadecimal and decimal codes for every ASCII character.

PRODUCT ANNOUNCEMENTS **18**

Systems, software, peripherals...

LETTERS **4**

ADVERTISER INDEX **54**

EDITORIAL	Tony Bove & Cheryl Rhodes (chief editors) Steve Rosenthal, Kelly Smith (contributing editors) Thomas Howe, Sam Perkins, Robert Cowart (writers)
ART	Lon Shoemaker (cartoons), Paul Winternitz (photos)
PRODUCTION	Lon Shoemaker
CIRCULATION	William Shoemaker, Kathy Slusser
ADVERTISING	Jay Eisenberg, JE Publisher's Representative Company (213) 467-2266 (See advertiser index page for information.)

Typesetting by George Graphics, San Francisco
and AbraType, Palo Alto.
Lithographic camera work by
Hope & Allen Publishing, San Mateo
and Camera/Graphic, Palo Alto.
Printing by Technoweb, San Jose.

CP/M is a registered trademark of Digital Research, Inc. IBM is a registered trademark of International Business Machines. WordStar is a trademark of MicroPro, Intl. Perfect Writer is a trademark of Perfect Software. MS-DOS is a trademark of Microsoft. Mini-Ledger is a trademark of Paradigm Consultants. Punctuation & Style is a trademark of Oasis Systems.
User's Guide and Impatient User's Guide are trademarks of TUG, Inc.
User's Guide (TUG, Inc.) is not affiliated with Digital Research, Microsoft, or any hardware or software manufacturer or distributor.

Letters to the Editors

PC or Not PC, Perfect Writer, Sanyo Modem7 and more...

Expand to Cover PC!

After buying the first four issues at computer shops, I recently subscribed to your magazine. I find it very helpful and informative...

I see that you have now expanded your scope to include PC-DOS software. I welcome the addition, particularly because we have just added two IBM PCs at the office, and I am intrigued with the possibilities of being able to communicate and transfer files between the office computer and my Northstar Advantage at home. I will be looking forward to learning to what extent it may be feasible.

I sincerely hope you will be successful in keeping *User's Guide* going. You are providing a unique and valuable service. In spite of my own particular interest in the expansion into PC-DOS, I hope you will retain a strong focus on your original objectives and not try to cover too broad a scope. I suspect many readers will lose interest if a scatter-gun approach gives them only an occasional article of specific interest.

Keep the faith, and keep up the good work!

Trevor H. Atkinson
Napa, CA

We cover software for MS-DOS and CP/M systems, not the software that is specific only to the IBM PC. Our focus must remain broad enough to cover what our readers use (CP/M and MS-DOS computers), yet narrow enough to be of specific interest.

We walk this tightrope by providing a mix of specific tutorials on popular products and popular topics, reference guides to popular systems, opinions on a variety of products, system overviews of the most compatible systems and expansion products on the market, and the new user forum for expressing opinions on personal computer consumer topics.

Our purpose is to be a hands-on tool for users first and foremost, and second, to be of interest to casual readers interested in the topics presented.

Thanks for your feedback. We hope to hear from more of you.

Don't Cover IBM!

I am reluctant to continue with my subscription since the incorporation of IBM PC articles which will dilute the effectiveness of the *Guide* for my CP/M interests. I will try one year, but if the emphasis goes to IBM I will *drop it*. IBM dominates too much already.

R. D. Winquist
Fremont, CA

I want to add my support to the opinion expressed by Thomas Hope Norman in his letter (issue #7). I hadn't realized until I looked closely at

Publisher's Statement ...

Feedback

We changed our magazine subtitle to "the magazine for IBM PC and CP/M system users," and a flood of letters came in. Roughly one-third of the letter-writers expressed dismay at our new direction and thought we were abandoning CP/M. Another third expressed gratitude that we were now covering MS-DOS (one said "Now that I'm using an IBM PC at work and a CP/M system at home, your magazine is the only one that is truly useful"). The final third expressed a "wait-and- see" attitude while renewing their subscriptions.

It is true that most magazine readers do not write letters. Some editors believe that most letters written to editors are complaint letters or take-action letters; but we have an equal share of positive and negative letters. However, ninety percent of our readers provided very positive feedback (renewal dollars), so we can conclude that the readership has accepted our new direction.

Perhaps it is the magazine's role in helping users that makes it so popular with subscribers. We managed to steer a course through the melee of new products and cover only the software packages that are available for both CP/M and MS-DOS systems, or software available only for CP/M systems.

Somebody has to do it. The "poor and underpriviledged working class" of one million CP/M users is neglected by others but not by this magazine.

the cover of that issue that the *User's Guide* had changed... to another magazine covering the IBM PC, with CP/M system users second.

Like Mr. Norman, I subscribed to your magazine because I have a CP/M system, one that seems to have been orphaned by its manufacturer, the DEC VT180, and wanted to know about what's going on in the CP/M world. I am inundated with information about the IBM PC. All of the larger magazines — from *Infoworld* to *Personal Computing* — are almost exclusively dedicated to the IBM PC. In fact, it's hard to open any magazine dealing with computers even remotely without seeing an article about the IBM PC or software for it. On the other hand, it isn't so easy to find out about what's going on with CP/M systems.

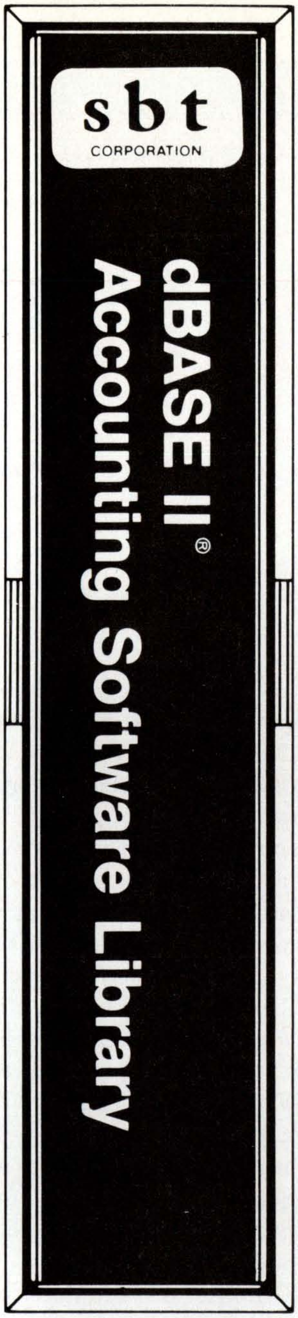
Your magazine has given me good information in the past — like the article about RCP/M systems and others about public domain software and specific CP/M packages. That's what I want to know about — what software and hardware is available for CP/M. I'd like more than you have provided on assembly language programming, getting into the system BIOS and things like that, and maybe you will get around to those areas one of these days. But you won't have the time or space if you start covering the IBM PC, its relatives, and software for them.

As for your position that you have to cover the IBM PC in order to attract sufficient advertising to survive, I think you may be missing somebody someplace. There are many CP/M software and hardware suppliers, many more than I see advertise in your magazine... I don't think the problem is that you don't cover the IBM PC — I think it is that you don't do a good job of selling advertising for some reason.

John N. DeBoice, Ph.D.
Martinez, CA

Our first issue in late 1982 contained a system overview of the IBM PC. We have always covered software that runs on CP/M or on both MS-DOS and CP/M. We have a substantial

continued on page 54



SBT GIVES IT AWAY!
. . . for a very good reason — so *you* have control over your accounting. With the source code, you can add a special part number system or change a report format at will — the possibilities are endless. You get control and flexibility that's crucial to a well run business. What's more, every SBT Accounting Program can change and grow with your needs.

CHANGE IT!
With SBT Accounting Software, changes are made quickly and easily. Whether you need special invoice forms, unique mailing lists, or an inventory costing formula that would challenge an Einstein, SBT Software can be changed to fit your needs in less time than you would think!

GROW WITH IT!
When your company grows, SBT Accounting Software grows with you (right up to 65,000 customers, for example). But a system that just handles more customers is not enough. When you grow, you also change the way you do business (which means changing the way your software does business). You can make the changes yourself, or SBT will make them for you quickly and inexpensively.

INTEGRATE IT!
SBT is *the source* for modular, integrated accounting systems that can be quickly and easily changed to fit your needs. Start with the modules you need now, and add the others later. Best of all, SBT Software works on all personal computers that can run dBase II*.

.dOrder II	Sales Order Processing	$195
.dInvoice II	Billing and Inventory	$195
.dStatement II	Accounts Receivable	$95
.dPurchase II	Purchase Orders	$195
.dPayable II	Accounts Payable	$295
.dPayroll II	Payroll and Labor Acctg.	$395
.dLedger II	General Ledger/Finance	$395
.dAssets II	Fixed Asset and Depreciation Acctg.	$195
.dBackup II	Automatic File Backup	$39

For more information call SBT at 408/980-8880.

DEMO DISKS AVAILABLE

SBT Corporation
1140 Mountain View–Alviso Road
Sunnyvale, California 94089

MAY THE SOURCE BE WITH YOU

sbt
CORPORATION

dBase II* SOURCE CODE INCLUDED WITH ALL SBT ACCOUNTING SOFTWARE

*dBase II is a registered trademark of Ashton-Tate

Circle number 8 on the reader service card.

Are CP/M Users Dropouts?

CP/M users feel like second-class citizens in the IBM world.

Have the one million CP/M users become a new "underground" in this industry? Not politically left or right, but anti-hype and especially anti-IBM, this international community of users is left out of the mainstream of hype and publicity, and neglected by software publishers who announce new products for everything but CP/M.

We sympathize with the anti-hype position. Marketing hype is humorous at best but often misleading. Some of the worst ads lead you to believe that IBM PC compatibility and MS-DOS compatibility are the same thing.

We understand the anti-IBM position. In many people's view, IBM stamped out the "grassroots" standards that evolved in the industry and installed its own "standards" through market domination. Who can sympathize with the giant whose corporate personality is usually summarized as smug and arrogant?

We do not understand why software publishers choose to neglect the installed base of one million CP/M-80 users. Surely some major publishers want to develop software for these people. They are easy to please — they already have experience with computers. This CP/M crowd not only needs software — they need printers, hard disks, floppy disks, other accessories and services, and links to the future IBM PC network.

Some existing CP/M-80 users want to buy new computers, perhaps running MS-DOS, but they are opposed to buying IBM. We appreciate the spirit they bring to the marketplace. Their efforts keep alive the *other* computer manufacturers (not IBM and not Apple) who produce excellent machines.

For example, some PC-compatible computers from different manufacturers offer the best of all worlds by offering CP/M-80 compatibility as well as MS-DOS. Some PC-compatible computers are much faster than the IBM PC, some cheaper, some both. PC-compatible manufacturers have to provide something that makes their machine better than IBM's *and* better than the other compatibles.

MS-DOS offers ways to make programs more transportable from computer to computer; the problem is that some of the best software developers chose to use IBM's special functions coded in the copyrighted ROM. This ROM was the bait for IBM's trap (Corona, Eagle and others were caught) that is now making life miserable for some of the PC-compatible manufacturers.

IBM may be innocent of any wrongdoing, but one fact is that no manufacturer can be 100% compatible with IBM's machine. This compatibility issue should now rest in peace, and manufacturers should move on to making computers that are *better* than the IBM PC as well as somewhat compatible.

MS-DOS provides most if not all of the "somewhat compatible" nature of the PC-compatible computers. The next generation of compatibles will probably run the new Digital Research concurrent operating system that lets you run both CP/M and MS-DOS programs.

The similarities between MS-DOS and CP/M make it easier to make any CP/M or MS-DOS program available over a wide variety of MS-DOS computers including the IBM PC. The installed base of one million CP/M users will need software to communicate and transfer data with MS-DOS systems. CP/M users who want to expand their systems have everything to gain by upgrading their systems to run MS-DOS.

Note to the undergrounders: supporting MS-DOS does not mean you are supporting IBM. MS-DOS may actually become the competing "standard" in this arena if IBM goes through with rumored plans to announce a new operating system for workstation PCs. IBM will surely use more copyrightable ROM to get the jump on the compatible manufacturers.

Meanwhile, MS-DOS and Concurrent CP/M are systems that every PC-compatible computer can run, including the PC. For new computer buyers who want compatibility *and* choice, the computers that run both MS-DOS and CP/M-80 are today's best choices. ◻

Computerized Accounting

What to consider when putting together an accounting system.

Accounting for a small business or profession is a very good reason for getting a personal computer. Small businesses want to liberate their bookkeeping from outside computer services to have a better understanding and awareness of day-to-day activities and to cut costs. They want bookkeeping done simply and cheaply, with instant reporting at their fingertips. Personal computers and software packages are inexpensive enough to cut bookkeeping costs tremendously.

However, if your small business is accustomed to doing it on paper, and your paper system is adequate and cost-effective, you may be better off without the computer until your business grows beyond the capabilities of the paper system.

Whether you are liberating your accounting from a computer service, or growing beyond your paper system, there are several things you must consider before plunging into a computerized accounting system:

1. The computerized accounting system will be harder to understand and maintain than a paper system.

The advantage of using a computerized system is the ability to handle *much more* data at a faster pace. However, most paper systems are better organized and clearer to understand. You should use the paper system as a model for the computerized system — use a system that supplies the same clear paper reports and transaction logs.

2. You will use a lot of floppy disks, tapes or cartridges, whichever media you use for work and for data archives.

If your computer uses floppy disks without a hard disk, you will need to change to a new work disk as the current one wears out (depending on use), and keep two backup copies of the work disk. A work disk is one that holds the program and system.

If your computer has a hard disk, you can use part of the hard disk as the "work disk," but you will still need at least two backup copies of the program and system.

No matter whether you use a hard disk or floppy disks, you will also need at least two backup copies of every data disk. A data disk holds the most current transactions; when it fills up you can place it in an archive and start using a new data disk.

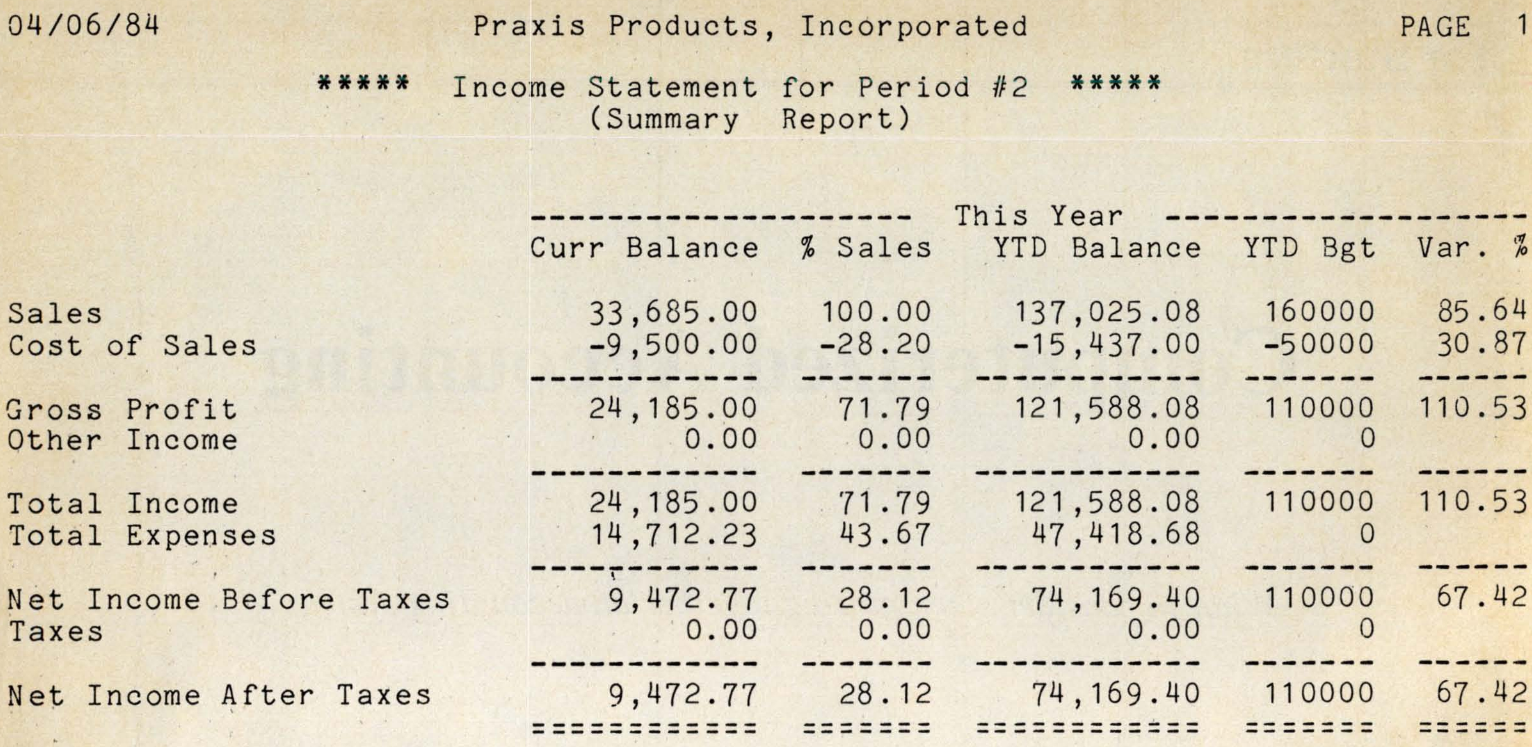
3. Most of the well-known vintage accounting packages are designed for widget manufacturers. If you are not a widget manufacturer, you will have to adapt your business to the package, or change the package to reflect the way you do business.

The inventory module of most packages is organized by part number and purchase order. If you make a variety of widgets and you can calculate costs easily for each widget, you're all set. If, however, your costs vary with each issue or occurrence of a sale (such as a magazine or service with an inventory), you may need to customize the package to set up an accurate inventory.

4. If you choose to adapt your business to the package, you may get away with doing it all yourself. If you choose to adapt the package to your business, you should either hire a consultant or learn programming.

4a. Find a package designed specifically for your application. This may be impossible to find, but look anyway — you may get lucky.

The new "service sector" accounting packages are sup-



```
04/06/84              Praxis Products, Incorporated                                    PAGE   1

                  *****  Income Statement for Period #2  *****
                                (Summary  Report)

                            -------------------- This Year ------------------
                            Curr Balance  % Sales  YTD Balance   YTD Bgt  Var. %

Sales                         33,685.00   100.00    137,025.08    160000   85.64
Cost of Sales                 -9,500.00   -28.20    -15,437.00    -50000   30.87
                            ------------ -------  ------------  -------  ------
Gross Profit                  24,185.00    71.79    121,588.08    110000  110.53
Other Income                       0.00     0.00          0.00         0
                            ------------ -------  ------------  -------  ------
Total Income                  24,185.00    71.79    121,588.08    110000  110.53
Total Expenses                14,712.23    43.67     47,418.68         0
                            ------------ -------  ------------  -------  ------
Net Income Before Taxes        9,472.77    28.12     74,169.40    110000   67.42
Taxes                              0.00     0.00          0.00         0
                            ------------ -------  ------------  -------  ------
Net Income After Taxes         9,472.77    28.12     74,169.40    110000   67.42
                            ============ =======  ============  =======  ======
```

Sales
4000 — 4999 Income
    4100 Sales, widget #1
    4200 Sales adjustments
    4300 Sales, services

Cost of Sales
5000 — 5999 Cost of Goods
    5100 Materials, widget #1
    5200 Materials, widget #2
    5300 Factory Salaries

Total Expenses
6000 — 6999 Expenses
    6100 Office Expenses
    6200 Officer's Salaries
    6300 Advertising Expenses

Figure 1. *The income/expense statement summarizes the expense, sales and cost of goods sold accounts.*

posed to be excellent for service-oriented businesses like professional consulting. There are so-called "vertical" packages for doctors and lawyers. Most have not been critically evaluated, but they may work as "off-the-shelf" accounting systems. Most parallel paper accounting systems.

5. Accounting programs require lots of report printing. Get a good fast printer and keep it connected at all times during use of the accounting package.

Most accounting packages are designed to print voluminous reports to be used as an audit trail. Do not skip the printing of these reports, even if the package you use gives you this choice. Reports are absolutely necessary in any effort to appease IRS auditors.

6. If your business depends heavily on a system that tells you the state of your receivables, be sure to get one that has a proven bug-free record, and use a paper system in tandem.

Don't settle for a program that has bugs, and don't rely heavily on a program or a computer — implement a paper system that operates in tandem with the computer. If you can remember in your head who owes you what, you are better off with a paper system anyway!

7. Be sure to find a package that can print invoices and statements on regular forms you can buy from the least expensive forms dealer, or on forms you already have for this purpose. Ask for demonstrations of invoice-printing and statement-printing on the same equipment you have or are buying.

You may be surprised to know that some accounting packages will not work properly with standard printers. Many packages require wide-carriage printers (132 columns per line). Others will let you print using smaller printers but the reports may have wrapped-around lines and may be hard to read.

8. Set up a chart of accounts that will be sufficient for the entire fiscal year. Get an accountant for this and do it right, or use the accounts you have been using in your paper system.

The chart of accounts determines how complex and how useful your accounting system can be. It is crucial to have a

```
04/06/84            Praxis Products, Incorporated              Page  1

                         Balance Sheet for period #  2
                              (Summary  Report)

                                  Current Period

Current Assets                      179,955.55
Fixed Assets                        163,441.30
Other Assets                         18,500.00
                                 --------------
Total Assets                        361,896.85
                                 ==============

Current Liabilities                  18,427.45
Long Term Liabilities                52,500.00
                                 --------------
Total Liabilities                    70,927.45
Equity                              216,800.00
                                 --------------
Total Liabilities and Equity        287,727.45
                                 ==============
```

Total Assets

1000 — 1999 Asset
  1001 Cash
  1100 Accounts Receivable
  1500 Equipment

Total Liabilities

2000 — 2999 Liability
  2100 Accounts Payable
  2200 Notes Payable
  2300 Long Term Debt

Equity

3000 — 3999 Capital
  3100 Capital Stock
  3200 Preferred Stock
  3300 Retained Earnings

Figure 2. *The balance sheet summarizes the asset, liability and capital accounts.*

chart of accounts that will provide the appropriate summary data to a tax accountant. Have an accountant help you devise one (if you don't already have one in your paper system).

When making your chart of accounts, keep it simple, and make room for later expansion. Keep one cash account even if you have multiple checking accounts, and don't use different departments unless you are managing a large company. Number your accounts in increments of at least ten so that you can insert new accounts later.

Accounts are numbered according to convention. Your accounting package may require certain number ranges for specific types of accounts; e.g., 1000 through 2000 for assets, etc.

The accounts are summarized in two reports: an income/expense statement and a balance sheet. Figure 1 shows an income/expense statement with expenses, cost of goods sold and income summarized from the appropriate accounts: expense, sales (income) and cost of goods sold. Figure 2 shows a balance sheet that summarizes the asset, liability and capital accounts.

At tax time you may not want to produce your own balance sheet and income/expense statement. With all accounting packages you can present a tax accountant with a trial summary of the accounts and let the accountant make high-level decisions such as how to characterize income and expenses.

Crucial to any manufacturing business are the cost of goods sold and sales accounts. These must summarize correctly the nature of your business. Separate the bills you pay that directly contribute to the manufacturing or production of something sold from the bills you pay to keep yourself in business. The former are cost of goods, the latter are expense accounts. If costs are different for each type of product, create a different sales account for each type of product.

Asset, liability and capital accounts should be explained to you by an accountant (or read a textbook on double-entry business accounting).

A crash course in accounting may prove helpful, but if you understand how to use your computer and install the software, you are miles ahead of some accountants. You can then get a consultant to simply explain details and draw up a chart of accounts. With the right accounts in place and the modules installed properly, you could handle daily accounting tasks yourself.

Opinion...

CP/M-80 •
CP/M-86 •
PC-DOS •
MS-DOS •

Using Mini-Ledger

A simple and easy-to-use accounting program for small businesses and professionals

By Sam Perkins

© 1984 Sam Perkins

If you run a small business, one of the most demanding problems you face is that of keeping coherent financial records. You probably were delighted when computers started becoming affordable, thinking they were the solution to your problems. "All I'll have to do is have the data typed into the computer, then type a simple command, and out will come my beautifully-organized financial records. Taxes will be a cinch!"

Then you started looking at accounting programs — those huge, many-moduled, "complete" programs you saw advertised everywhere. "Written by CPA's," the ads said.

Typesetting Conventions

Throughout this article we use *THIS typeface* to show exactly what you should type at your keyboard, with the special symbols ↑ for the Control key (CTRL, CNTL or ALT on some keyboards), and ↵ for the Return key (RET, CR or Carriage Return on some keyboards).

We also use This Typeface to show messages displayed by the system or by programs.

Most likely your first thought after seeing an accounting program was that you would have to take at least two classes; first, an accounting class so you could learn about double-entry bookkeeping, then another class to learn how to run the program. You probably thought to yourself that if your mother had meant for you to be an accountant, you would have already become one by now. And not only that, you didn't want to spend all your time running a computer.

Isn't there anything simpler? Yes, if your bookkeeping needs are fairly simple. Mini-Ledger answers the needs of many small businesses and professionals. However, before we sing the praises of Mini-Ledger, we'll first describe accounting programs in general.

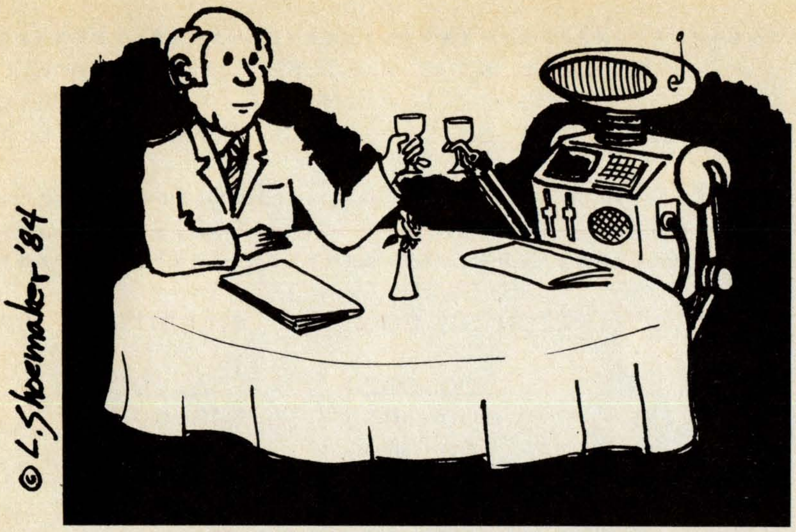
Large and Small Accounting Programs

Large accounting packages exist because they fill a need. There are many businesses whose accounting needs are so complex that nothing less will do. The businesses that need large accounting packages are large enough to need payroll, accounts receivable, accounts payable, inventory, and perhaps many other capabilities as well. These businesses need a package that integrates these operations in order to provide profit and loss statements at a moments notice. Some businesses need complete financial reports, sales reports, accounts receivable aging reports and inventory stock reports every week.

The trade-off is that these businesses can probably afford to have one person, or maybe several people, tied up doing accounting. They can afford the time it takes to learn these kinds of programs. The people that use these packages probably already know about double-entry bookkeeping.

At the other end of the scale there are programs which are little more than checkbook balancing programs. For many individuals and a few businesses, these are enough. You enter your checks and deposits into the computer and it keeps everything in balance. You usually get a few categories you can code checks to and that provides some help at tax time.

Mini-Ledger is available from Paradigm Consultants, Fremont CA.



MY DINNER WITH ANDROID

Mini-Ledger is In-between

Mini-Ledger seems to be designed for people who want to use their computers as tools rather than restructure their whole company around computer activities. My first impression when I started working with it was, "This is just how I've been doing things all along. Isn't this nice?"

Mini-Ledger doesn't do everything. It doesn't have a payroll module, it doesn't have an accounts payable module, it won't do a true profit and loss statement, and it doesn't have an accounts receivable module, though we'll talk more about that later. If you have strong needs in those areas, Mini-Ledger is not for you.

Perhaps the best way of telling you what Mini-Ledger will do is to take you through using it. When we finish, you should be in a position to know whether it fits your circumstances.

Setting Up the Program

In many circumstances you get an unconfigured version of Mini-Ledger (the IBM PC version is already configured). When you start the program by typing LEDGER followed by a return, a message appears on the screen informing you that the program has not yet been configured for your computer. You are told to press Return to continue.

When you press Return, the program automatically begins the configuration process, presenting a list or menu of computers and terminals. At the bottom of the menu is a message telling you to type the number of the computer or terminal most like yours. Since there are over thirty different computers and terminals listed, the chances are very good that your computer or terminal is included. If your computer or terminal is not listed, there are instructions in the manual for how to set up the program for any terminal.

After setting up the program for your computer or terminal, you automatically start setting up the program for your printer. Again, you are presented with a list of over thirty printers to choose from. If your printer is not listed, the manual tells you how to configure the program for unlisted printers.

Finally, you are asked to designate which disk drive to use for storing your accounts. You can use the same disk drive used for storing the program, or a different one. If you intend to run more than one account with Mini-Ledger, you will probably want to designate drive B as your storage drive and use drive A as your program drive.

Setting up this program is as easy as any program I have seen.

Once you have set up the program for your computer, your printer, and designated a storage drive, you are through with configuration and are ready to start using the program.

Setting Up a Chart of Accounts

Mini-Ledger handles the chart-of-account concept in an interesting way — you can assign code and sub-code numbers to each account.

For example, let's say that in your business you buy a lot of office supplies, and that you buy them from several different suppliers. If you are interested in how much you spend with each supplier, you would set up a main category for office supplies and then assign sub-categories for each individual supplier. Like this:

```
00-0010 OFFICE SUPPLIES
01-0010 CROSBY OFFICE SUPPLY
02-0010 S.F. OFFICE CENTER
03-0010 GREYBAR OFFICE SUPPLY
04-0010 MISC SUPPLIERS
```

When you pay your bills, code your checks to the proper account. Mini-Ledger can provide you with reports which lump together all expenses with a main code of 0010 (which your accountant might want), or you can get reports showing the amounts for each subcode.

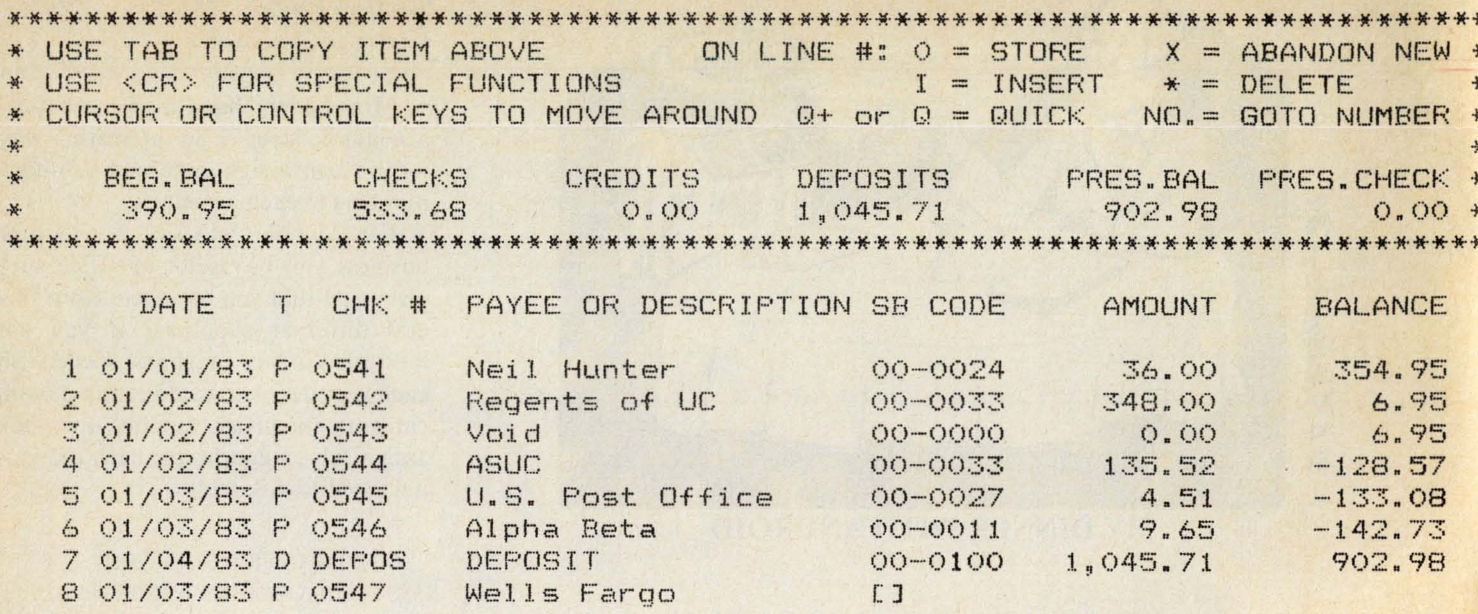
You can use a total of ninety-nine of these codes in any way you want. I was told of one woman who has forty-four income categories and thirty-one expense categories. Most businesses will probably use around fifty to sixty different categories.

Entering Income and Expenses

Mini-Ledger provides you with an elegant method of entering your expenses and income. From the main menu you choose number one: ENTER EXPENSES AND INCOME.

The program loads a module into memory, and presents a split screen: the top part is a window full of instructions, and the bottom part is where you make your entries. (The Mini-Ledger manual refers to the top part as the instruction box, but I like the concept of a window.)

The window includes instructions



```
***********************************************************************
* USE TAB TO COPY ITEM ABOVE          ON LINE #: O = STORE     X = ABANDON NEW
* USE <CR> FOR SPECIAL FUNCTIONS                 I = INSERT    * = DELETE
* CURSOR OR CONTROL KEYS TO MOVE AROUND  Q+ or Q = QUICK     NO.= GOTO NUMBER
*
*    BEG.BAL       CHECKS       CREDITS      DEPOSITS        PRES.BAL  PRES.CHECK
*     390.95       533.68          0.00      1,045.71          902.98        0.00
***********************************************************************

       DATE    T  CHK #  PAYEE OR DESCRIPTION SB CODE       AMOUNT      BALANCE

   1 01/01/83 P  0541    Neil Hunter          00-0024        36.00       354.95
   2 01/02/83 P  0542    Regents of UC        00-0033       348.00         6.95
   3 01/02/83 P  0543    Void                 00-0000         0.00         6.95
   4 01/02/83 P  0544    ASUC                 00-0033       135.52      -128.57
   5 01/03/83 P  0545    U.S. Post Office     00-0027         4.51      -133.08
   6 01/03/83 P  0546    Alpha Beta           00-0011         9.65      -142.73
   7 01/04/83 D  DEPOS   DEPOSIT              00-0100     1,045.71       902.98
   8 01/03/83 P  0547    Wells Fargo          []
```

Figure 1. *Mini-Ledger's screen for data entry. You make your entries across the screen, much in the same way you type across the screen with a word processing program.*

for moving your cursor around, inserting and deleting lines, and accessing special functions, and it displays a row of dollar amounts across the bottom.

One of the concepts of the program is that you will want to keep track of your income and expenses on a monthly basis. The amounts in the bottom of the window show your beginning balance, the dollar amount of checks you have written, the amount of your deposits, the amount of any credits you have made and a final amount called PRESENT CHECK. More about that later.

You make your entries across the screen, much in the same way you type across the screen with a word processing program.

At the left side of the screen you type in the date, then you enter a transaction type of which there are four possibilities:

P for payment
V for void
D for deposit
C for credit

If you try to use anything other than those four, the instruction window at the top clears and you are given an explanation of what the valid entries are.

The next entry is the check number. In this section you can enter either numbers or letters; for example, you would enter numbers for checks or the word *DEPOSIT* to indicate a deposit.

Next, enter a description of the transaction. Usually, this will be the payee of the check, but you have twenty spaces to use any way you want. For example, you might put in something like *TRANSFER OF FUNDS.*

After the payee or description has been entered, enter the sub and main codes. As soon as you do, the instruction window again clears and a message appears which shows you the description you have given that code. To follow the example we started with above, if you entered the codes 01-0010, in the instruction window you would get this message:

```
01-0010 CROSBY OFFICE SUPPLY
```

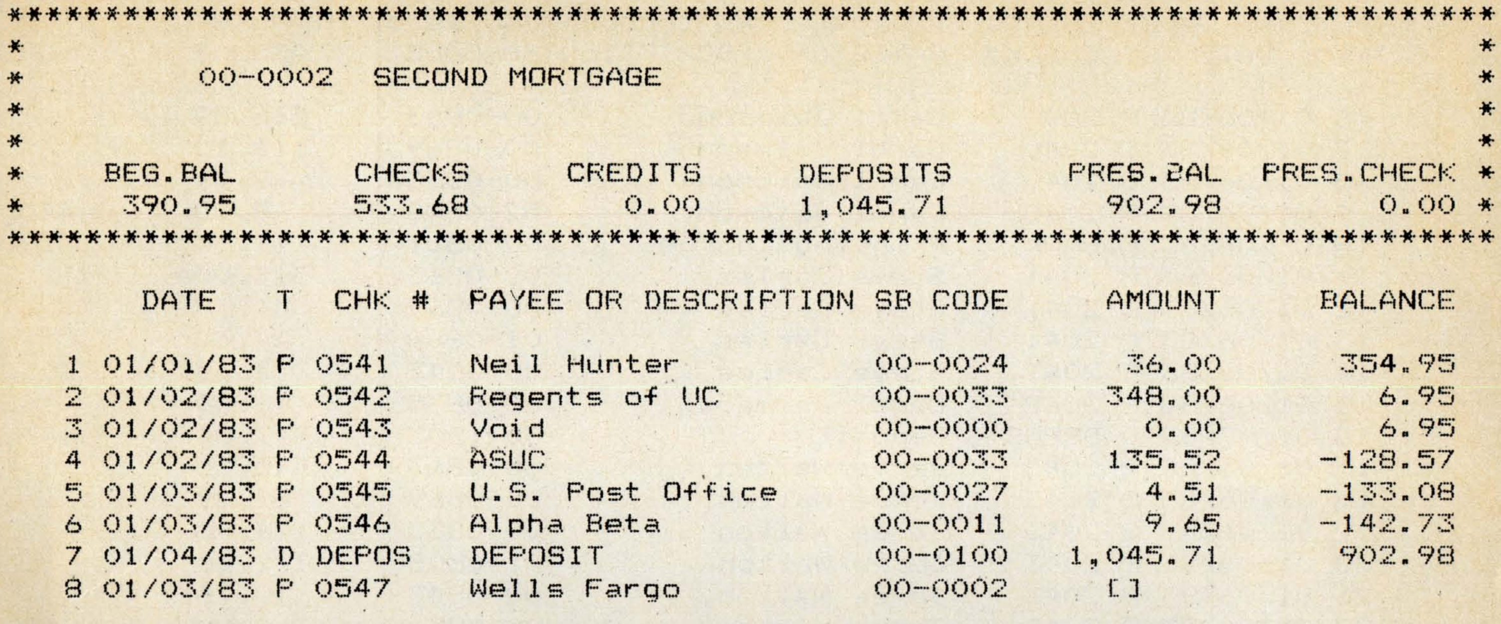
This display lets you quickly see if you have made a mistake, and you can make your correction on the spot.

After entering the sub and main codes, you enter the amount, and your cursor automatically jumps to the next line, ready for you to make your next entry.

At this point, you begin to get a feeling for the quality of this program. It was obviously designed to save you as many keystrokes as possible. For example, if the date of the entry you are about to make is the same as the one above, you simply press the Tab key and the date repeats on the present line. If the transaction type (payment, void, deposit or credit) is the same, press the Tab key and the entry for the line above is copied. For the check number field, the Tab key copies the check number from above, while the Return key (a special feature) gives you a new check number, one greater than the last one used.

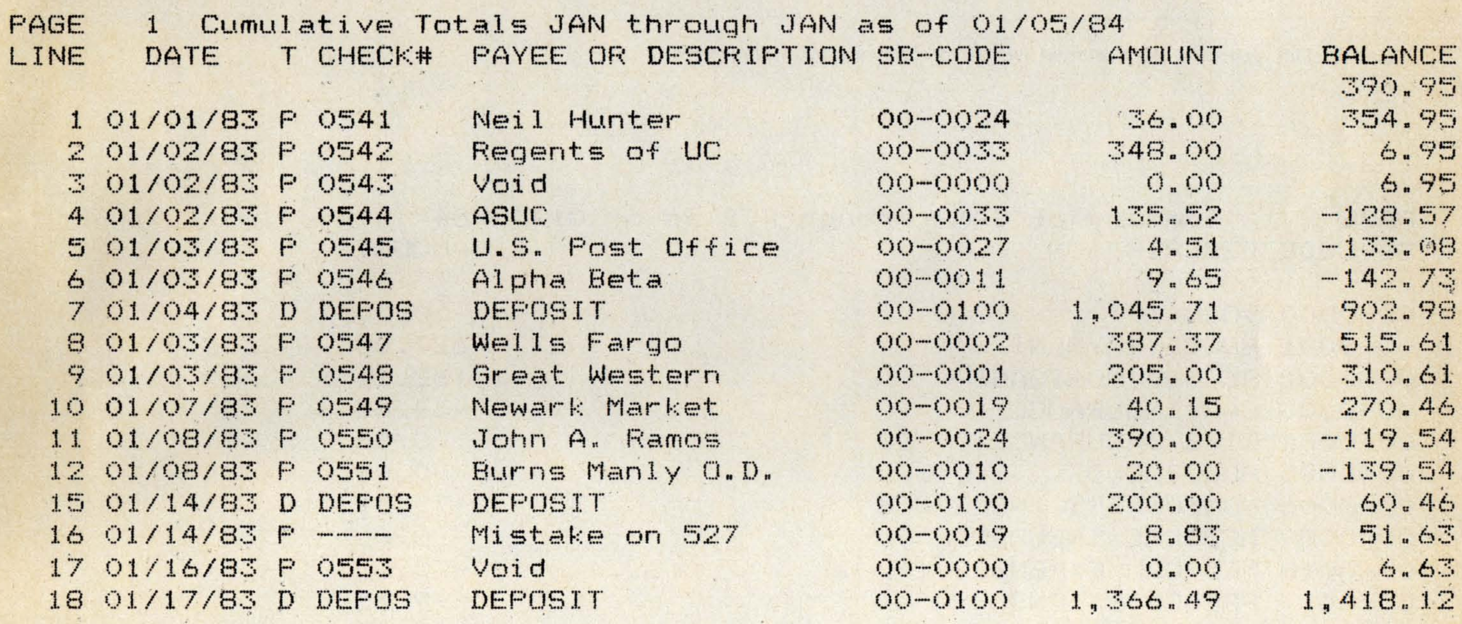
There are other special features accessed by pressing the Return key. For example, if you enter a *D* in the transaction field and press Return for the check number, the word DEPOS appears. Press Return again and the description of the transaction becomes *Deposit.* This means you don't have to spend a lot of time typing words.

You may often write one check which is for several different categories of expense. Perhaps the most usual occurrence of this is when paying a credit card bill. To record this in Mini-Ledger you simply continue to use the same check number and assign a different code to each amount. In the instruction window the PRESENT CHECK amount shows you the total of all the entries for that check.



```
*******************************************************************************
*                                                                             *
*          00-0002  SECOND MORTGAGE                                           *
*                                                                             *
*                                                                             *
*    BEG.BAL      CHECKS      CREDITS      DEPOSITS        PRES.2AL  PRES.CHECK *
*     390.95      533.68         0.00      1,045.71          902.98        0.00 *
*******************************************************************************

        DATE    T  CHK #   PAYEE OR DESCRIPTION SB CODE        AMOUNT      BALANCE

     1 01/01/83 P 0541     Neil Hunter          00-0024         36.00       354.95
     2 01/02/83 P 0542     Regents of UC        00-0033        348.00         6.95
     3 01/02/83 P 0543     Void                 00-0000          0.00         6.95
     4 01/02/83 P 0544     ASUC                 00-0033        135.52      -128.57
     5 01/03/83 P 0545     U.S. Post Office     00-0027          4.51      -133.08
     6 01/03/83 P 0546     Alpha Beta           00-0011          9.65      -142.73
     7 01/04/83 D DEPOS    DEPOSIT              00-0100      1,045.71       902.98
     8 01/03/83 P 0547     Wells Fargo          00-0002        []
```

Figure 2. *The data entry screen in figure 1 showing the account-code error checking.*



```
PAGE    1  Cumulative Totals JAN through JAN as of 01/05/84
LINE    DATE    T CHECK#   PAYEE OR DESCRIPTION SB-CODE        AMOUNT      BALANCE
                                                                            390.95
     1 01/01/83 P 0541     Neil Hunter          00-0024         36.00       354.95
     2 01/02/83 P 0542     Regents of UC        00-0033        348.00         6.95
     3 01/02/83 P 0543     Void                 00-0000          0.00         6.95
     4 01/02/83 P 0544     ASUC                 00-0033        135.52      -128.57
     5 01/03/83 P 0545     U.S. Post Office     00-0027          4.51      -133.08
     6 01/03/83 P 0546     Alpha Beta           00-0011          9.65      -142.73
     7 01/04/83 D DEPOS    DEPOSIT              00-0100      1,045.71       902.98
     8 01/03/83 P 0547     Wells Fargo          00-0002        387.37       515.61
     9 01/03/83 P 0548     Great Western        00-0001        205.00       310.61
    10 01/07/83 P 0549     Newark Market        00-0019         40.15       270.46
    11 01/08/83 P 0550     John A. Ramos        00-0024        390.00      -119.54
    12 01/08/83 P 0551     Burns Manly O.D.     00-0010         20.00      -139.54
    15 01/14/83 D DEPOS    DEPOSIT              00-0100        200.00        60.46
    16 01/14/83 P ----     Mistake on 527       00-0019          8.83        51.63
    17 01/16/83 P 0553     Void                 00-0000          0.00         6.63
    18 01/17/83 D DEPOS    DEPOSIT              00-0100      1,366.49     1,418.12
```

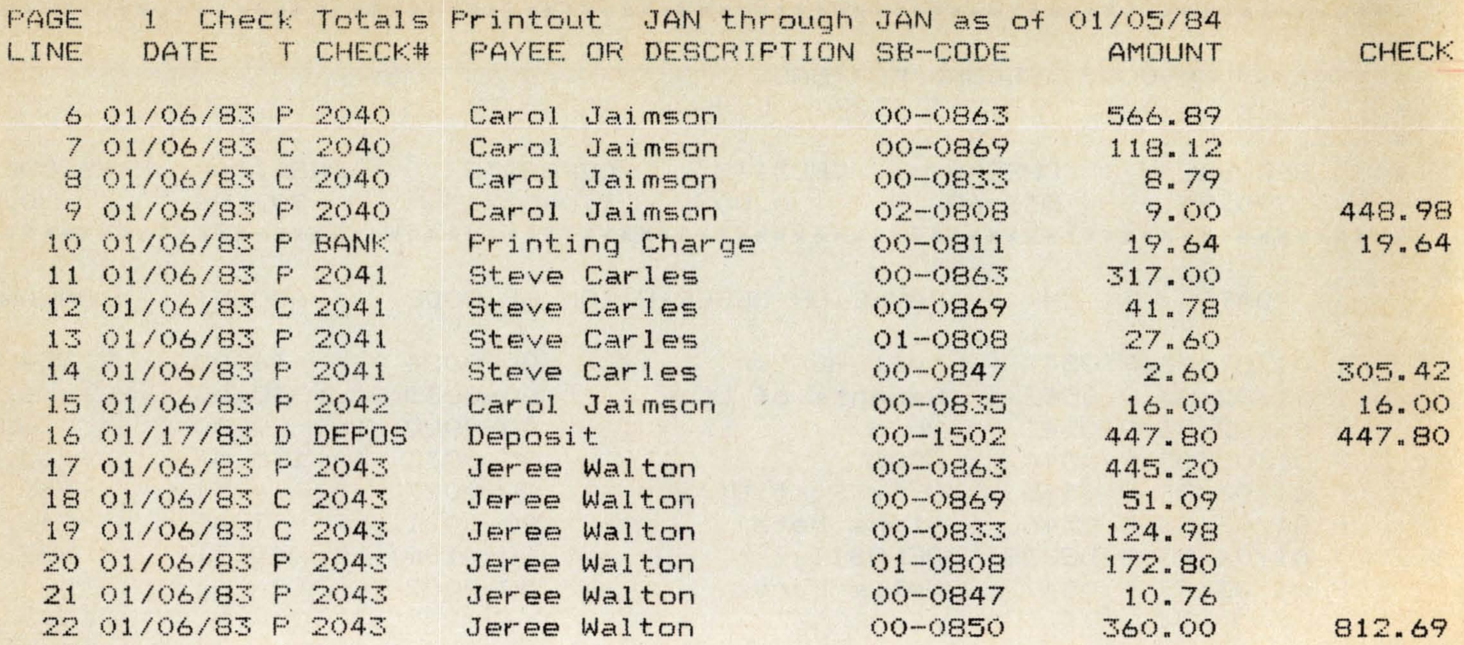
Figure 3. *This cumulative report shows a running balance down the right side and can be used as a check register.*

Adding New Chart-of-Account Categories

One of the main irritations of using most accounting packages is that if you discover you need a new chart-of-account category while making entries, you must exit from the data entry part of the program, load up the chart-of-accounts module, create your new category, exit from that part of the program, and finally go back and make your entry.

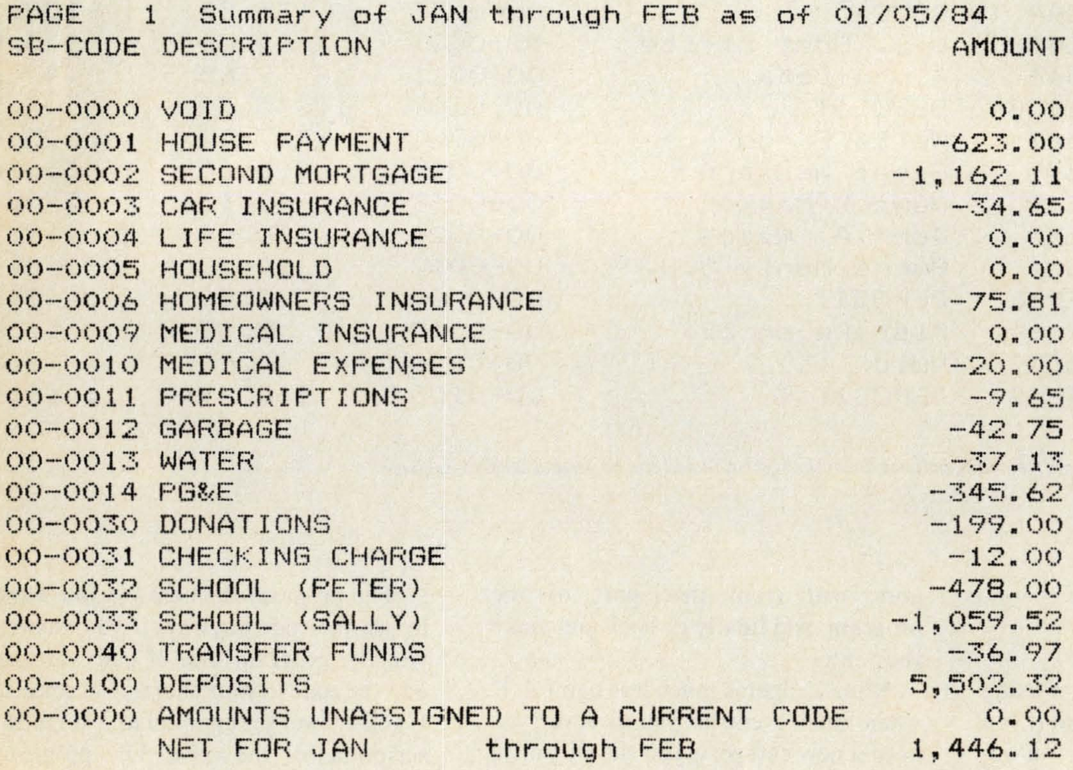
Mini-Ledger is much less painful. If when making entries you discover you need a new category, you simply put in the subcode and main code you want to use for it. The computer beeps, the instruction window clears and a message tells you that the code does not exist.

The program then asks if you want to use the code anyway. If you answer yes, the program asks if you want to add the code to your chart-of-accounts. If you answer yes again, it asks for a description for the code. The program then adds the code to the list and your cursor returns to the section of the screen where you enter the amount of your transaction.



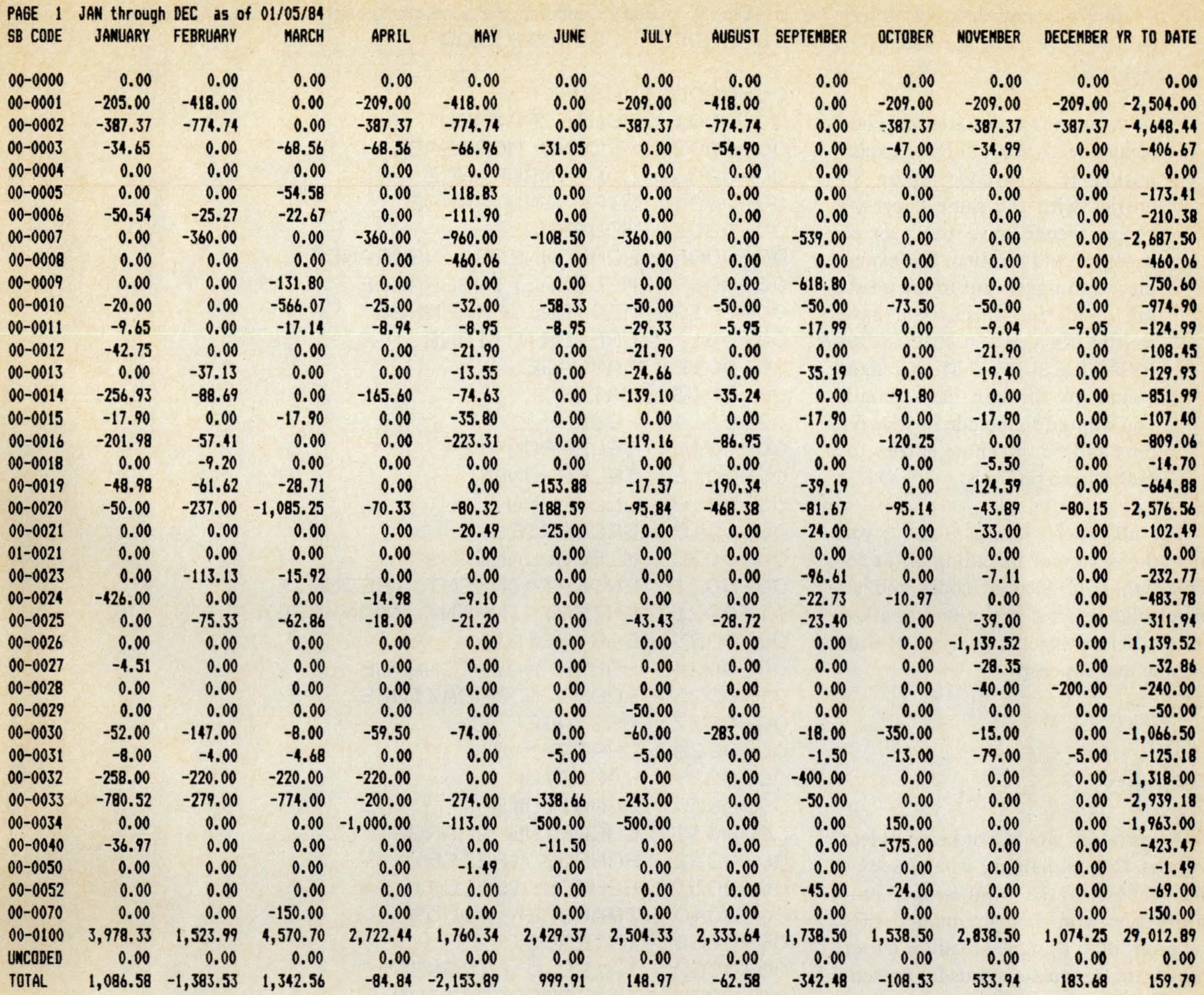
```
PAGE    1  Check Totals Printout  JAN through JAN as of 01/05/84
LINE     DATE    T CHECK#  PAYEE OR DESCRIPTION SB-CODE       AMOUNT          CHECK

   6 01/06/83 P 2040     Carol Jaimson         00-0863       566.89
   7 01/06/83 C 2040     Carol Jaimson         00-0869       118.12
   8 01/06/83 C 2040     Carol Jaimson         00-0833         8.79
   9 01/06/83 P 2040     Carol Jaimson         02-0808         9.00         448.98
  10 01/06/83 P BANK     Printing Charge       00-0811        19.64          19.64
  11 01/06/83 P 2041     Steve Carles          00-0863       317.00
  12 01/06/83 C 2041     Steve Carles          00-0869        41.78
  13 01/06/83 P 2041     Steve Carles          01-0808        27.60
  14 01/06/83 P 2041     Steve Carles          00-0847         2.60         305.42
  15 01/06/83 P 2042     Carol Jaimson         00-0835        16.00          16.00
  16 01/17/83 D DEPOS    Deposit               00-1502       447.80         447.80
  17 01/06/83 P 2043     Jeree Walton          00-0863       445.20
  18 01/06/83 C 2043     Jeree Walton          00-0869        51.09
  19 01/06/83 C 2043     Jeree Walton          00-0833       124.98
  20 01/06/83 P 2043     Jeree Walton          01-0808       172.80
  21 01/06/83 P 2043     Jeree Walton          00-0847        10.76
  22 01/06/83 P 2043     Jeree Walton          00-0850       360.00         812.69
```

Figure 4. *This report is a check printout with the total for each check at the right.*



```
PAGE    1  Summary of JAN through FEB as of 01/05/84
SB-CODE DESCRIPTION                                    AMOUNT

00-0000 VOID                                             0.00
00-0001 HOUSE PAYMENT                                 -623.00
00-0002 SECOND MORTGAGE                             -1,162.11
00-0003 CAR INSURANCE                                  -34.65
00-0004 LIFE INSURANCE                                   0.00
00-0005 HOUSEHOLD                                        0.00
00-0006 HOMEOWNERS INSURANCE                           -75.81
00-0009 MEDICAL INSURANCE                                0.00
00-0010 MEDICAL EXPENSES                               -20.00
00-0011 PRESCRIPTIONS                                   -9.65
00-0012 GARBAGE                                        -42.75
00-0013 WATER                                          -37.13
00-0014 PG&E                                          -345.62
00-0030 DONATIONS                                     -199.00
00-0031 CHECKING CHARGE                                -12.00
00-0032 SCHOOL (PETER)                                -478.00
00-0033 SCHOOL (SALLY)                              -1,059.52
00-0040 TRANSFER FUNDS                                 -36.97
00-0100 DEPOSITS                                     5,502.32
00-0000 AMOUNTS UNASSIGNED TO A CURRENT CODE             0.00
        NET FOR JAN       through FEB                1,446.12
```

Figure 5. *This monthly summary report shows the amount spent or received for each chart-of-account code.*



```
PAGE  1  JAN through DEC  as of 01/05/84
SB CODE     JANUARY   FEBRUARY      MARCH      APRIL        MAY       JUNE       JULY     AUGUST  SEPTEMBER    OCTOBER   NOVEMBER   DECEMBER YR TO DATE

00-0000        0.00       0.00       0.00       0.00       0.00       0.00       0.00       0.00       0.00       0.00       0.00       0.00       0.00
00-0001     -205.00    -418.00       0.00    -209.00    -418.00       0.00    -209.00    -418.00       0.00    -209.00    -209.00    -209.00  -2,504.00
00-0002     -387.37    -774.74       0.00    -387.37    -774.74       0.00    -387.37    -774.74       0.00    -387.37    -387.37    -387.37  -4,648.44
00-0003      -34.65       0.00     -68.56     -68.56     -66.96     -31.05       0.00     -54.90       0.00     -47.00     -34.99       0.00    -406.67
00-0004        0.00       0.00       0.00       0.00       0.00       0.00       0.00       0.00       0.00       0.00       0.00       0.00       0.00
00-0005        0.00       0.00     -54.58       0.00    -118.83       0.00       0.00       0.00       0.00       0.00       0.00       0.00    -173.41
00-0006      -50.54     -25.27     -22.67       0.00    -111.90       0.00       0.00       0.00       0.00       0.00       0.00       0.00    -210.38
00-0007        0.00    -360.00       0.00    -360.00    -960.00    -108.50    -360.00       0.00    -539.00       0.00       0.00       0.00  -2,687.50
00-0008        0.00       0.00       0.00       0.00    -460.06       0.00       0.00       0.00       0.00       0.00       0.00       0.00    -460.06
00-0009        0.00       0.00    -131.80       0.00       0.00       0.00       0.00       0.00    -618.80       0.00       0.00       0.00    -750.60
00-0010      -20.00       0.00    -566.07     -25.00     -32.00     -58.33     -50.00     -50.00     -50.00     -73.50     -50.00       0.00    -974.90
00-0011       -9.65       0.00     -17.14      -8.94      -8.95      -8.95     -29.33      -5.95     -17.99       0.00      -9.04      -9.05    -124.99
00-0012      -42.75       0.00       0.00       0.00     -21.90       0.00     -21.90       0.00       0.00       0.00     -21.90       0.00    -108.45
00-0013        0.00     -37.13       0.00       0.00     -13.55       0.00     -24.66       0.00     -35.19       0.00     -19.40       0.00    -129.93
00-0014     -256.93     -88.69       0.00    -165.60     -74.63       0.00    -139.10     -35.24       0.00     -91.80       0.00       0.00    -851.99
00-0015      -17.90       0.00     -17.90       0.00     -35.80       0.00       0.00       0.00     -17.90       0.00     -17.90       0.00    -107.40
00-0016     -201.98     -57.41       0.00       0.00    -223.31       0.00    -119.16     -86.95       0.00    -120.25       0.00       0.00    -809.06
00-0018        0.00      -9.20       0.00       0.00       0.00       0.00       0.00       0.00       0.00       0.00      -5.50       0.00     -14.70
00-0019      -48.98     -61.62     -28.71       0.00       0.00    -153.88     -17.57    -190.34     -39.19       0.00    -124.59       0.00    -664.88
00-0020      -50.00    -237.00  -1,085.25     -70.33     -80.32    -188.59     -95.84    -468.38     -81.67     -95.14     -43.89     -80.15  -2,576.56
00-0021        0.00       0.00       0.00       0.00     -20.49     -25.00       0.00       0.00     -24.00       0.00     -33.00       0.00    -102.49
01-0021        0.00       0.00       0.00       0.00       0.00       0.00       0.00       0.00       0.00       0.00       0.00       0.00       0.00
00-0023        0.00    -113.13     -15.92       0.00       0.00       0.00       0.00       0.00     -96.61       0.00      -7.11       0.00    -232.77
00-0024     -426.00       0.00       0.00     -14.98      -9.10       0.00       0.00       0.00     -22.73     -10.97       0.00       0.00    -483.78
00-0025        0.00     -75.33     -62.86     -18.00     -21.20       0.00     -43.43     -28.72     -23.40       0.00     -39.00       0.00    -311.94
00-0026        0.00       0.00       0.00       0.00       0.00       0.00       0.00       0.00       0.00       0.00  -1,139.52       0.00  -1,139.52
00-0027       -4.51       0.00       0.00       0.00       0.00       0.00       0.00       0.00       0.00       0.00     -28.35       0.00     -32.86
00-0028        0.00       0.00       0.00       0.00       0.00       0.00       0.00       0.00       0.00       0.00     -40.00    -200.00    -240.00
00-0029        0.00       0.00       0.00       0.00       0.00       0.00     -50.00       0.00       0.00       0.00       0.00       0.00     -50.00
00-0030      -52.00    -147.00      -8.00     -59.50     -74.00       0.00     -60.00    -283.00     -18.00    -350.00     -15.00       0.00  -1,066.50
00-0031       -8.00      -4.00      -4.68       0.00       0.00      -5.00      -5.00       0.00      -1.50     -13.00     -79.00      -5.00    -125.18
00-0032     -258.00    -220.00    -220.00    -220.00       0.00       0.00       0.00       0.00    -400.00       0.00       0.00       0.00  -1,318.00
00-0033     -780.52    -279.00    -774.00    -200.00    -274.00    -338.66    -243.00       0.00     -50.00       0.00       0.00       0.00  -2,939.18
00-0034        0.00       0.00       0.00  -1,000.00    -113.00    -500.00    -500.00       0.00       0.00     150.00       0.00       0.00  -1,963.00
00-0040      -36.97       0.00       0.00       0.00       0.00     -11.50       0.00       0.00       0.00    -375.00       0.00       0.00    -423.47
00-0050        0.00       0.00       0.00       0.00      -1.49       0.00       0.00       0.00       0.00       0.00       0.00       0.00      -1.49
00-0052        0.00       0.00       0.00       0.00       0.00       0.00       0.00       0.00     -45.00     -24.00       0.00       0.00     -69.00
00-0070        0.00       0.00    -150.00       0.00       0.00       0.00       0.00       0.00       0.00       0.00       0.00       0.00    -150.00
00-0100    3,978.33   1,523.99   4,570.70   2,722.44   1,760.34   2,429.37   2,504.33   2,333.64   1,738.50   1,538.50   2,838.50   1,074.25  29,012.89
UNCODED        0.00       0.00       0.00       0.00       0.00       0.00       0.00       0.00       0.00       0.00       0.00       0.00       0.00
TOTAL      1,086.58  -1,383.53   1,342.56     -84.84  -2,153.89     999.91     148.97     -62.58    -342.48    -108.53     533.94     183.68     159.79
```

Figure 6. *This yearly summary report shows the amount spent or received in each category for each month.*

Printing Reports

Once you have entered your expenses and income, Mini-Ledger provides several different ways to look at and analyze the data. The printout menu has six different choices:

1 - PRINT MONTHLY FILES WITH CUMULATIVE TOTALS
2 - PRINT MONTHLY FILES WITH CHECK TOTALS
3 - PRINT A SUMMARY OF SOME MONTHS
4 - PRINT YEARLY SUMMARY
5 - PRINT PAYMENT CODES
6 - PRINT A PREVIOUSLY-CREATED PAYCODE REPORT

1 — This printout gives you the equivalent of a check register with a running balance down the right side (See figure 3).

2 — This printout is similar to the cumulative printout, but shows the amount of each check in the right column instead of a running balance. This is very helpful when you have multiple codes for each check (see figure 4).

3 — This printout shows you how much you have spent or how much income you have for each chart-of-account category. You can include as little as one month in your printout or as much as a full year (see figure 5).

4 — The yearly summary gives you what looks like a spreadsheet printout with your chart-of-account codes down the left side and the names of the months across the top. At the far right is a year-to-date column (see figure 6).

5 — The paycode printout simply lists your chart of accounts (See figure 7).

6 — A previously-created paycode report needs some further explanation: In a paycode report, all entries with the same chart-of-account code have been sorted together and totalled. For example, you might want to see a listing of all the checks you have written for code 01-0010 CROSBY OFFICE SUPPLY. Mini-Ledger would go through each month you wanted to include in your report and put all those entries together (see figure 8).

For all reports except *2* and *5* you have the option of including all or selected chart-of-account codes and all or selected payee descriptions, to allow you to do very specific analyses of your income and expenses.

```
PAGE 1  Paycodes Printout as of 01/05/84
SB-CODE   DESCRIPTION

00-0000  VOID
00-0001  HOUSE PAYMENT
00-0002  SECOND MORTGAGE
00-0003  CAR INSURANCE
00-0004  LIFE INSURANCE
00-0005  HOUSEHOLD
00-0006  HOMEOWNERS INSURANCE
00-0009  MEDICAL INSURANCE
00-0010  MEDICAL EXPENSES
00-0011  PRESCRIPTIONS
00-0012  GARBAGE
00-0013  WATER
00-0014  PG&E
00-0015  TELEPROMPTER
00-0016  TELEPHONE
00-0018  CLOTHING
00-0019  GROCERIES
00-0020  MISCELLANEOUS
00-0021  ENTERTAINMENT (DEDUCT)
01-0021  ENTERTAINMENT (NON-DED)
00-0023  CAR REPAIR
00-0024  HOUSE MAINTENANCE
00-0025  BOOKS & MAGAZINES
00-0027  POSTAGE
00-0028  CHRISTMAS
00-0029  VACATION
00-0030  DONATIONS
00-0031  CHECKING CHARGE
00-0032  SCHOOL (PETER)
00-0033  SCHOOL (SALLY)
00-0040  TRANSFER FUNDS
00-0050  INTEREST
00-0052  TAXES & LICENSES
00-0070  TAX PREPARATION
00-0100  DEPOSITS
```

Figure 7. *The chart of accounts for these examples.*

Summary

A summary would not be complete without first explaining what I see as the purpose of the Mini-Ledger program. The Mini-Ledger manual says the program is designed to allow a user to prepare financial records for presentation to an accountant.

After using the program for some time, I believe that is only part of what it is useful for. Because of the variety of reports the program produces, and the amount of selectivity which it allows over what goes into those reports, I think one of its major functions is to allow business owners to do fairly detailed analyses of their operations, primarily their cash flow. That is a very important, if not primary consideration for a small business.

Mini-Ledger has many strengths, including ease of use. Much of that ease comes from the fact that most operations are chosen from menus and there is very little which the user has to remember.

Another strength is the flexibility which comes from allowing free choice of codes for the chart of accounts. This in turn creates a weakness: the program will not provide a true profit and loss statement. It's one of those things you can't have both ways. If you have completely free choice, there is no way the program can predict what your chart of accounts will look like. If the program doesn't know what categories you will be using, it can't put them into profit and loss format.

Some programs give you limited categories within which you have to assign codes, which creates problems if you have too many codes for one category. You've either got to revise your thinking about your chart of accounts, or go out and spend more money and get a bigger program. Usually the bigger the package is, the more complex it is and the harder it is to learn and to use.

It seems that the people who wrote Mini-Ledger decided that since they were designing the program for people who were going to send their records to an accountant, they would let the accountant produce the profit and loss statements and the full financial state-

```
PAGE    1  Sorted Printout  JAN through DEC as of 01/05/84

LINE    DATE    T CHECK # PAYEE OR DESCRIPTION SB-CODE       AMOUNT  CUMULATIVE

   8 01/03/83 P 0547    Wells Fargo          00-0002        387.37      -387.37
   8 02/06/83 P 0575    Wells Fargo          00-0002        387.37      -774.74
  31 02/27/83 P 0595    Wells Fargo          00-0002        387.37    -1,162.11
   7 04/03/83 P 0637    Wells Fargo          00-0002        387.37    -1,549.48
   1 05/01/83 P 0705    Wells Fargo          00-0002        387.37    -1,936.85
  34 05/31/83 P 758     Wells Fargo          00-0002        387.37    -2,324.22
   5 07/04/83 P 844     Wells Fargo          00-0002        387.37    -2,711.59
   5 08/02/83 P 742     Wells Fargo          00-0002        387.37    -3,098.96
  22 08/30/83 P 781     Wells Fargo          00-0002        387.37    -3,486.33
   1 10/01/83 P 811     Wells Fargo          00-0002        387.37    -3,873.70
   1 11/03/83 P 830     Wells Fargo          00-0002        387.37    -4,261.07
   3 12/03/83 P 852     Wells Fargo          00-0002        387.37    -4,648.44
  TOTAL 00-0002 SECOND  MORTGAGE                         -4,648.44

  12 01/08/83 P 0551    Burns Maeck O.D.     00-0010         20.00       -20.00
   8 03/10/83 P 0607    John Mines, M.D.     00-0010        185.00      -205.00
   9 03/10/83 P 0608    Peter Allen, M.D.    00-0010         25.00      -230.00
  25 03/25/83 P 0621    John James, M.D.     00-0010         25.00      -255.00
  27 03/26/83 P 0623    Credit Assurance Age 00-0010        185.87      -440.87
  29 03/26/83 P 0625    Goleta Valley Hospit 00-0010        145.20      -586.07
  14 04/05/83 P 0643    John Mines, M.D.     00-0010         25.00      -611.07
  18 05/19/83 P 720     Ray Harmond, DDS     00-0010         32.00      -643.07
   7 06/07/83 P 764     Peter Allen, M.D.    00-0010         18.33      -661.40
   8 06/08/83 P 765     Dr. deGirand         00-0010         20.00      -681.40
  20 06/15/83 P 774     Dr. deGirand         00-0010         20.00      -701.40
  13 07/14/83 P 850     Dr. deGirand         00-0010         50.00      -751.40
  12 08/11/83 P 747     Dr. deGirand         00-0010         50.00      -801.40
  11 09/09/83 P 796     Dr. deGirand         00-0010         50.00      -851.40
  11 10/18/83 P 818     Dr. deGirand         00-0010         50.00      -901.40
  12 10/18/83 P 819     Adams Dental X-ray   00-0010         23.50      -924.90
  16 11/07/83 P 843     Dr. deGirand         00-0010         50.00      -974.90
  TOTAL 00-0010 MEDICAL EXPENSES                           -974.90
```

Figure 8. *A detailed paycode report with similarly-coded items sorted together.*

ments. From my point-of-view, that was a good decision. Unless people who run businesses want to become experts in accounting, we are better off presenting accountants with our data and letting them apply their expertise. Mini-Ledger provides a very good way to prepare financial records for an accountant.

Mini-Ledger won't do everything. One thing it doesn't do is accounts receivable, although when I talked to the people at Paradigm about that I was given an interesting idea.

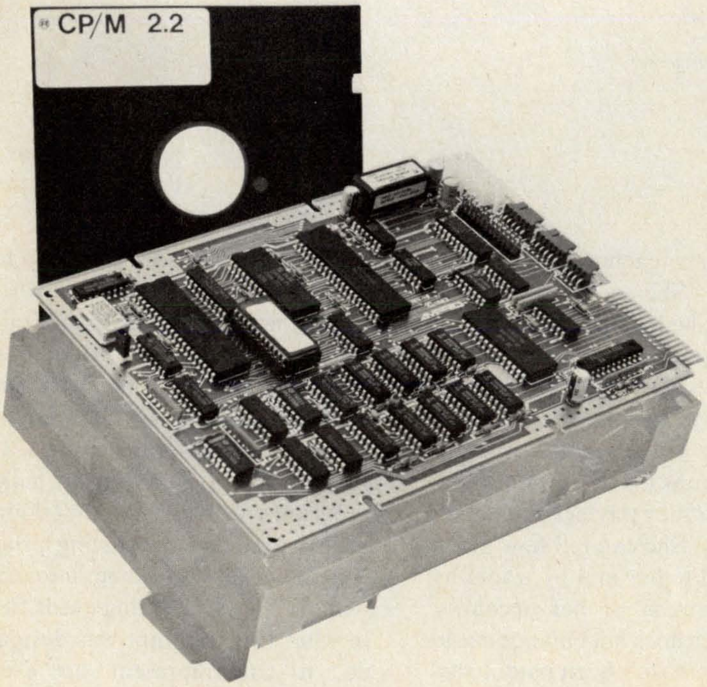
It seems that one user of the program is a piano teacher with fifty or sixty students. She sends each one a monthly bill. She has set up a separate Mini-Ledger program just for her receivables and has assigned a chart-of-account code to each student. When she sends out a bill she makes an entry in Mini-Ledger as if she had sent them a check. When they pay her she makes a deposit entry. She can tell how much money is owed to her and by whom by getting a summary of her accounts. Any code which does not balance out to zero means she hasn't been paid. I suspect that works quite well although there would be no clear way to age those receivables.

In conclusion, I feel that Mini-Ledger is a quality product. It seems virtually bug-free, having been on the market for nearly two years and having gone through several revisions. I tried very hard to find a way to make the program crash, and couldn't do it. It is one of the least frustrating programs you are likely to come into contact with. If your accounting needs fit within what this program was designed to do, it can represent an excellent investment.

New Product Announcements

This is how it works: we provide a reader service card in this issue with numbers on it. You circle the numbers corresponding to the product announcements you're interested in. We forward your name and address as filled out on the card to the product manufacturer or vendor, who sends you the information.

Thanks for filling out the questionaire on the card. This feedback helps us plot an editorial course and provides demographic information to media planners. We appreciate your support.



Computers & Systems

The Little Board

Ampro Computers (Mountain View, CA) claims that The Little Board® is the world's simplest and least expensive single-board CP/M computer. The Little Board screws directly into the mounting holes of a five-inch mini-floppy drive unit and was made for design engineers and system integrators who have tight packaging requirements.

Measuring just 7.75 x 5.75 inches and consuming less than five watts, The Little Board has a 4MHz Z80A processor with 64K RAM, and terminal, modem and printer ports. The price is $349. The package includes CP/M version 2.2 and a set of Ampro system utilities including a utility for reading and writing five-inch disks in various formats (Kaypro, Morrow, Osborne, IBM and others). One utility called Friendly is an implementation of ZCPR3 (Echelon, Inc.) which provides an easy-to-use menu system with UNIX-like capabilities.

Circle number **50** on your reader service card for more information.

From 1 to 4,080 Users

Digital Computer Corp. (San Diego, CA) unveiled its five-model line of OMNI multi-user computers running the CP/M-compatible TurboDOS system. TurboDOS supports the hardware configuration — a network of Z80 processors inside each computer — to support up to 4,080 users at the same time.

Each user has two serial port channels and two parallel channels. Processing speed is increased by using four DMA (direct memory address) channels rather than one. Each user has her/his own processor on an S-100 bus.

The OMNI computers are cost-effective alternatives to personal computer networks. A six-user personal computer network can cost up to $30,000; a six-user OMNI system costs about $16,000.

Circle number **53** on your reader service card for more information.

Polo PC

Polo Microsystems (Mountain View, CA) has rolled out the Polo Personal Computer System, a color CP/M-80 and MS-DOS computer for $3995. With the system is a 16-color high-resolution monitor and detached keyboard, a letter-quality printer, a built-in 300 baud modem, dual five-inch floppy drives and a package of application programs (word processing, spreadsheet, graphics and data base management).

Circle number **52** on your reader service card for more information.

Poly 8/16

PolyMorphic Systems (Santa Barbara, CA) announced the Poly 8/16, an S-100 computer with multi-user capability and multiple processors: the 80186 (sixteen bit) and the Z80 (eight bit). The system comes with Digital Research's new Concurrent CP/M-86 (version 3.1) that can run PC-DOS programs. The system also runs CP/M-80 programs.

The basic unit ($4995) has a Z80 with 64K RAM for running CP/M-80, and the 80186 (at 8 MHz) with 256K RAM expandable to 1 megabyte of RAM, with one 800K five-inch floppy, four serial ports, two parallel ports, an adjustable 14" monochrome display unit and detached low profile keyboard.

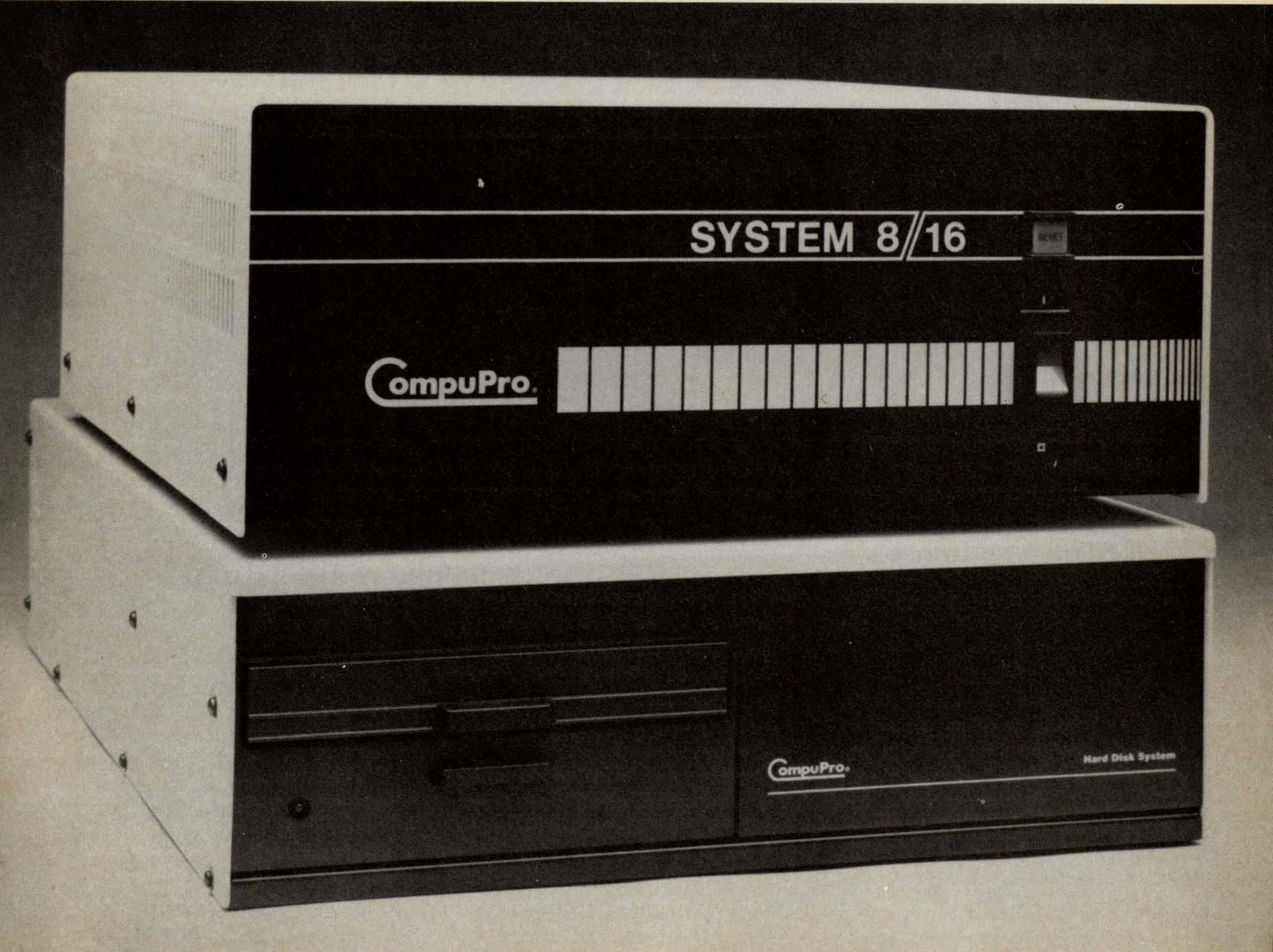
Circle number **51** on your reader service card for more information.

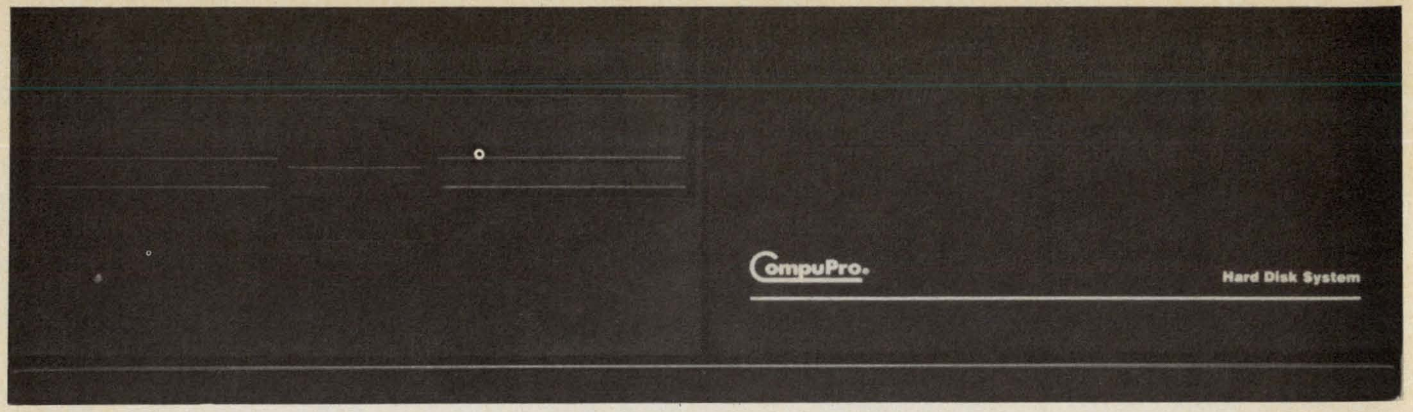
CompuPro 80286 System

CompuPro (Hayward, CA) introduced the first IEEE-696 (S-100) compatible computer based on the 80286 processor. The new System 816/F combines a 6MHz 80286 with an 80287 math co-processor to provide the fastest multi-user sixteen-bit system available.

The computer runs either CP/M-86 or MP/M-86. Hardware includes 512K static RAM expandable to 16 megabytes; twelve serial ports, one Centronics printer port, one parallel port, 1.2 megabytes of floppy storage, and a 40 megabyte hard disk. Convenience features include a clock/calendar, interrupt controllers, interval timers, and battery backed-up RAM. List price is $14,995.

Circle number **54** on your reader service card for more information.





Hard Disk Subsystem

CompuPro (Hayward, CA) introduced its 40-megabyte hard disk subsystem for IEEE 696/S-100 bus computers. Packaged in the standard CompuPro enclosure, the H40 hard disk subsystem features the Quantum Q540 five-inch hard disk, CompuPro's Disk 3 DMA disk controller, a single 2.4-megabyte eight-inch floppy drive (Qume Trak 842) for backup, and the CP/M-80 and CP/M-86 operating systems.

The floppy drive accepts both double-sided and single-sided floppy disks. The hard disk offers 40 megabytes (unformatted). The entire package retails for $5,495.

Circle number **55** on your reader service card for more information.

Software

Magic Index

Computer EdiType Systems (NY, NY) claims to have replaced the time-consuming, mechanical job of compiling index and table of contents entries with a pleasant and innovative program called MagicIndex.

You mark your index entries in the text as you type the text (using a word processing program of your choice). MagicIndex prepares the index entries and sub-entries. The length of an index entry is not limited to one line (useful for legal citations). The program creates a table of contents automatically using chapter/section headings in the text.

MagicIndex ($295) includes the features of MagicPrint and MagicBind. MagicPrint provides true proportional spacing and special effects, and MagicBind is a replacement for WordStar's MailMerge. MagicIndex by itself is ($150).

Circle number **56** on your reader service card for more information.

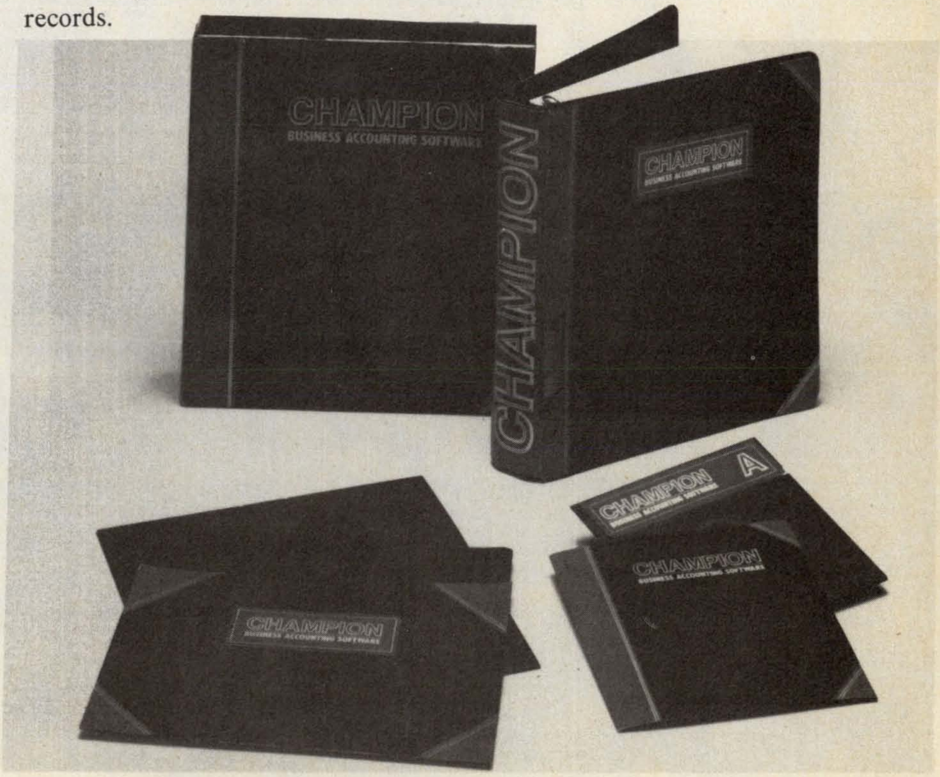
Medical Management

Alspa Computer (Campbell, CA) introduced the ACI Medical Office Manager program for use on the Alspa-Net low-cost local area network (see "Network Systems"). The software is designed for private practitioners and group practices and handles accounting and keeping medical records.

Designed for a network with security in mind as well as economical multiuser access, the program provides accounting information and medical records that are password-protected and simple for data entry. The system creates its own audit trail, stores multiple service codes for each procedure, and recognizes different insurance company forms.

The Alspa-Net with the Medical Office Manager is $12,950 (one workstation, ten megabyte hard disk with 1.2 megabyte floppy drive, and the TurboDOS system). A three-user system (three workstations) costs under $17,000.

Circle number **57** on your reader service card for more information.



dOrder and dPayroll

SBT Corp. (Sunnyvale, CA) announced two new modules for the SBT Accounting Software Library: dOrder II and dPayroll II. All modules are written in dBASE II and source files are included in the package.

dOrder II ($195) is a sales order entry and reporting system that lets you enter new customers or inventory items without leaving the the sales order procedure, and create invoices automatically.

dPayroll II ($395) calculates payroll tax and deducts for all employees in every payroll period (you define the period as weekly, semi-weekly, bi-weekly, or monthly). The module can produce the appropriate employer reports and tax return forms.

Circle number **59** on your reader service card for more information.

Sixteen-bit Accounting

Champion Software (Denver, CO) announced its sixteen-bit version of the Champion Business Accounting Software, available for CP/M-86, PC-DOS and MS-DOS. The program is a five module package written in dBASE II® (Ashton-Tate) and comes with a special "run-time" version. The accounting software is also available for CP/M-80 systems.

The modules include general ledger, accounts payable with purchase orders, inventory, payroll and accounts receivable. Each module is $595.

Circle number **58** on your reader service card for more information.

Qualifying Sales Leads

ACS Consultants (Millbrae, CA) announces Prospects Unlimited, a prospect management system for salespeople. It provides immediate access to information about sales leads, including a history of the prospect's past purchases and contacts with the salesperson.

Prospects Unlimited also reminds the salesperson about things to do on specific dates. Reports divide prospects by company name, job title, products purchased in the past, products to be purchased, and probability of sale.

The program is written in dBASE II and is supplied with source files. Cost: $349.

Circle number **60** on your reader service card for more information.

Checks & Balances

C.D.E. Software (Los Angeles, CA) announces Checks & Balances, a personal finance program for $49.95 that lets you display, add and change entries on the screen with full screen editing. The program displays category and bank totals, with pre-defined deposits, service charges, and other categories. The program is available for CP/M-80 systems.

Circle number **61** on your reader service card for more information.

Plotter Software

Centerpoint Computer Applications (Chicago, IL) announces the SIGN-PLOT plotter program that lets you produce six different letter font styles with typeset quality. SIGN-PLOT works with most of the popular pen plotters including models from Hewlett-Packard, Houston Instruments, Enter, Amdek, Strobe, Mannesman Tally, Apple and Calcomp. SIGN-PLOT ($149) is available for CP/M-80 and PC-DOS.

Circle number **62** on your reader service card for more information.

GrafTalk in Sixteen-bit

Redding Group (Ridgefield, CT) announced a sixteen-bit version of GrafTalk, a business graphics software package now with color menus.

GrafTalk lets you draw bar charts, pie charts, legends and other graphs from easy-to-use commands and menu choices. In this new release is a SKETCH command that lets you draw maps, symbols and other graphics. The software includes a text editing program and spreadsheet program.

GrafTalk is available for CP/M-80, CP/M-86, PC-DOS and MS- DOS systems including the IBM PC, the DEC Rainbow and the Zenith Z-100.

Circle number **64** on your reader service card for more information.

Business Graphics

Automated Professional Systems (NY, NY) announced APSGRAPH, a program that produces frequently used business graphics from line graphs, pie charts and bar graphs to stick graphs, step graphs and scatter plots.

APSGRAPH can read data from other spreadsheet or word processing programs. It can produce a single graph with overlayed images for each set of data. Depending on the printer or plotter you use, you can use up to 32,000 distinct colors or shadings. APSGRAPH ($295) is available for CP/M-80 systems.

Circle number **63** on your reader service card for more information.

ZCPR3 System Enhancer

Echelon, Inc. (Los Altos Hills, CA) has been selected by Richard Conn (author of the public domain ZCPR series of programs) as exclusive agent for licensing use of ZCPR3 and integrated application packages. ZCPR3 replaces the CCP of your CP/M-80 system to provide UNIX-like features.

Application programs integrated with ZCPR3 include TERM III (computer-to-computer or terminal-computer communications program), DISCAT (disk and file catalog program) and EMSG (a UNIX-like electronic mail facility).

Circle number **65** on your reader service card for more information.

Computer Calculator

There are those times when even a spreadsheet program is too cumbersome for the simple calculations you need to do. CALC, a program by Larry Pulka and distributed by Elliam Associates (Woodland Hills, CA), has most of the features of a desktop calculator.

You can use up to 20 variables including a "tax variable" set when the program is installed that calculates the tax on the value in memory, then add the tax to produce a total.

CALC, for $29.95, is available for CP/M-80 systems.

Circle number **66** on your reader service card for more information.

Otrona Disk Swapping

Mycroft Labs (Tallahassee, FL) announced COMPAT, a program for the Otrona Attache that lets you copy files to and from various manufacturer's five-inch floppy disk formats.

With this program you can copy from the Otrona to another format, copy from another format to the Otrona format, or copy from one non-Otrona format to another non-Otrona format. COMPAT ($195) can read and write most of the CP/M-80 and CP/M-86 five- inch disk formats.

Circle number **67** on your reader service card for more information.

Convert to IBM?

Personal Computer Products (Santa Clara, CA) announced conversion utilities and a file transfer program for use in CP/M- 80 systems, Apple IIe and III, and Radio Shack systems to convert programs and transfer data to IBM PCs.

The file transfer program lets you transfer any file to an IBM PC, even program files, encrypted or compressed files, spreadsheet files, and files with special codes embedded in text or data. The program conversion utilties help convert BASIC and COBOL programs to IBM PC versions. The entire package is $129.95.

Circle number **68** on your reader service card for more information.

Learn I/O

Logic Associates (Chicago, IL) offers TUTORI/O, an aid to studying CP/M file input/output functions for assembly language programmers. TUTORI/O is a visual aid to performing disk input/output using the BDOS disk functions of CP/M. TUTORI/O is $25.

Circle number **69** on your reader service card for more information.

Network Systems

Alspa-Kaypro-Eagle Net

Alspa Computers (Campbell, CA) announced the Add-Net® interface card and software package that lets Kaypro and Eagle 2 computers plug into a high-speed Alspa-Net local area network (LAN). The card provides an RS422 network interface.

Alspa-Net provides electronic mail and access to other computers operating as workstations on the network. With Add-Net installed in a Kaypro or Eagle 2, the computer can function as a workstation on a large or small Alspa-Net. The smallest network requires one workstation using Add-Net and one network master computer using the network operating system.

Alspa's Add-Net package costs $595. Alspa's CN-4001 network master computer costs $1195, and the TurboDOS operating system costs $750. One master will support up to 255 workstations.

Circle number **70** on your reader service card for more information.

Accessories

Data Encryption

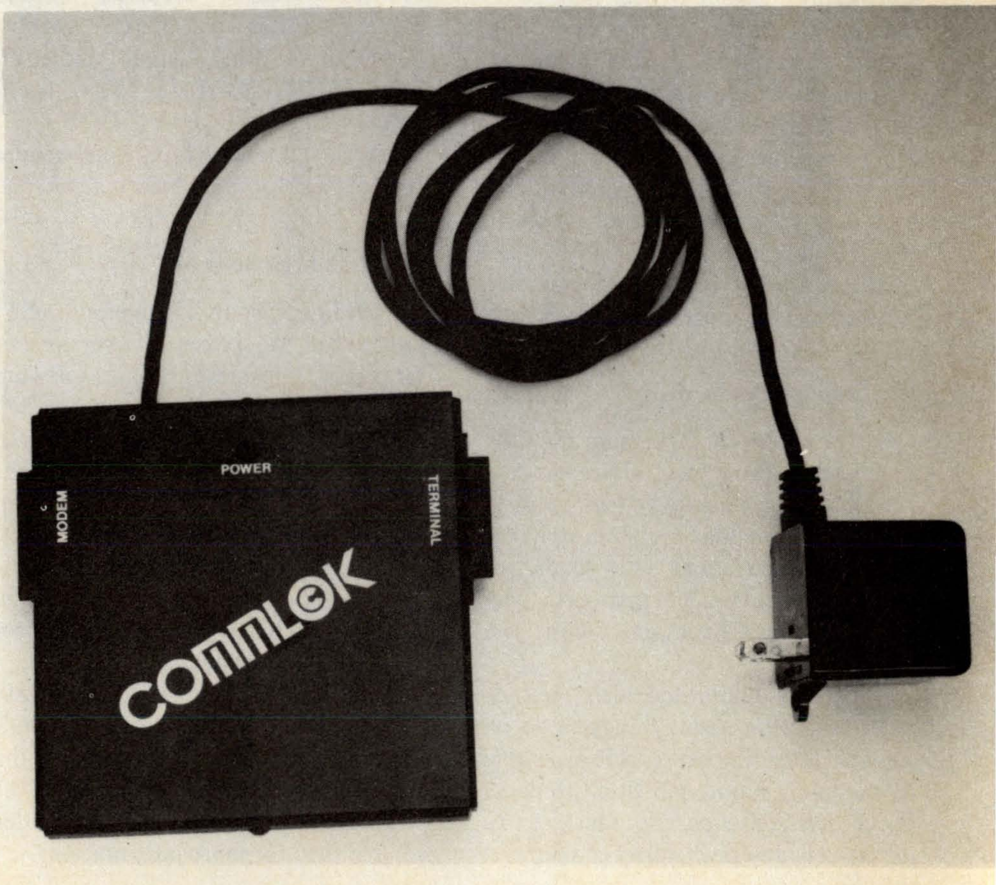
ADM Concepts (Simi Valley, CA) announced a low cost data system security link and encryption device, called the COMMLOCK Model-96A, that sits between the computers or terminals in a communication link.

You can program the COMMLOCK to create up to 1024 unique encryption codes. COMMLOCK provides separate encryption codes for the transmit and receive paths, which is a more complex pattern of encryption than the more common single-path method.

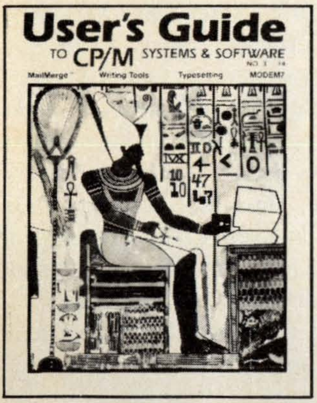
One COMMLOCK device connects between your computer or terminal and your modem, and another connects between the remote computer and its modem. COMMLOCK is compatible with asynchronous communication (used by most personal computers). Each device costs $600.

Circle number **71** on your reader service card for more information.

continued on page 24



6 TRAINING PACKAGES FOR $18


User's Guide
TO CP/M SYSTEMS & SOFTWARE
MailMerge™
Writing Tools
Typesetting
MODEM7

A subscription to ***USER'S GUIDE*** magazine provides the training you need to start using CP/M and MS-DOS systems (including the IBM Personal Computer).

USER'S GUIDE magazine contains self-teaching tutorials and hands-on application notes specific enough to be useful in your applications.

The editors of ***USER'S GUIDE*** evaluate software products while describing how to use them, providing you with the facts you need to make informed buying decisions.

User's Guide
TO SYSTEMS & SOFTWARE
CP/M Plus Tutorial
dBASE II Tutorial
Perfect Filer
Radio Shack Model 100
PMC MicroMate
TeleVideo & WordStar
Hard Disks

> "So far I haven't found one [issue] that wasn't worth more than what it costs. Recommended."
>
> — Jerry Pournelle, ***Byte*** Dec. 1983

User's Guide
CompuServe's Electronic Mail
Advanced WordStar
Communications Programs
COMMX vs. MITE
Perfect Writer vs. WordStar
Home/Office Telecommunications

USER'S GUIDE magazine features well written articles that help you get the most out of your computer investment. For example:

- How to get more mileage out of popular MS-DOS and CP/M programs like WordStar,® SuperCalc™ and dBASE II.™
- How to gain access to thousands of **free** programs in the public domain using a program called MODEM7.
- How to recover data from a damaged disk.
- How to set up and use a small business accounting system.

Make your computer investment profitable for only $18 a year.

User's Guide

THE MAGAZINE FOR IBM PC & CP/M SYSTEM USERS

☐ Send me six issues for $18, payment enclosed, or ☐ Bill me $21.
☐ Foreign (pre-paid): Canada & Mexico $22/six issues, overseas $40/six issues (airmail).
We accept Visa and Mastercard. Phone: 415-851-4836

Name ____________________

Company ____________________ Title ____________________

Address ____________________

City, State, Zip ____________________

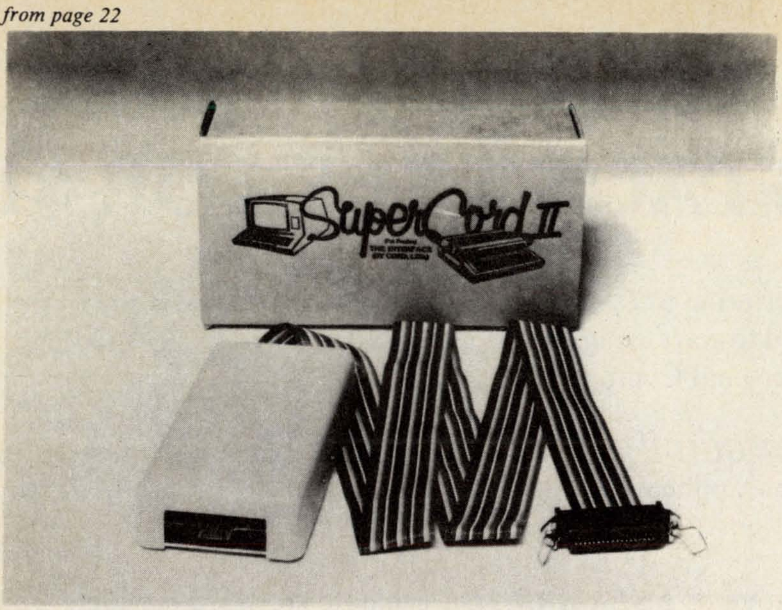
☐ Check if you do not want promotional mailings.

CP/M is a trademark of Digital Research.
WordStar is a trademark of MicroPro International.
SuperCalc is a trademark of SORCIM Corp.
dBASE II is a trademark of Ashton-Tate.
User's Guide is a trademark of TUG, Inc.

Make checks payable to: User's Guide. Offer expires 7/31/84
Subscription Dept.: P.O. Box 3050, Stanford, CA 94305.
Please allow 6-8 weeks for processing.

UG8

continued from page 22



Typewriter Interface

The SuperCord II interface, announced by Cord Ltd. (Santa Ana, CA), lets you use an ordinary typewriter as a printer connected to your computer. The SuperCord II can be used with many name-brand electronic typewriters: Adler, Brother, Royal, Smith-Corona, Silver-Reed and others.

The SuperCord has a 4K memory buffer to store data while the typewriter catches up. The typewriter prints at 110 baud (less than 15 characters a second), but your computer can transfer to the buffer at a faster rate and be free to perform other activities.

Circle number **72** on your reader service card for more information.

FREE INFORMATION

User's Guide **Reader Service Card**

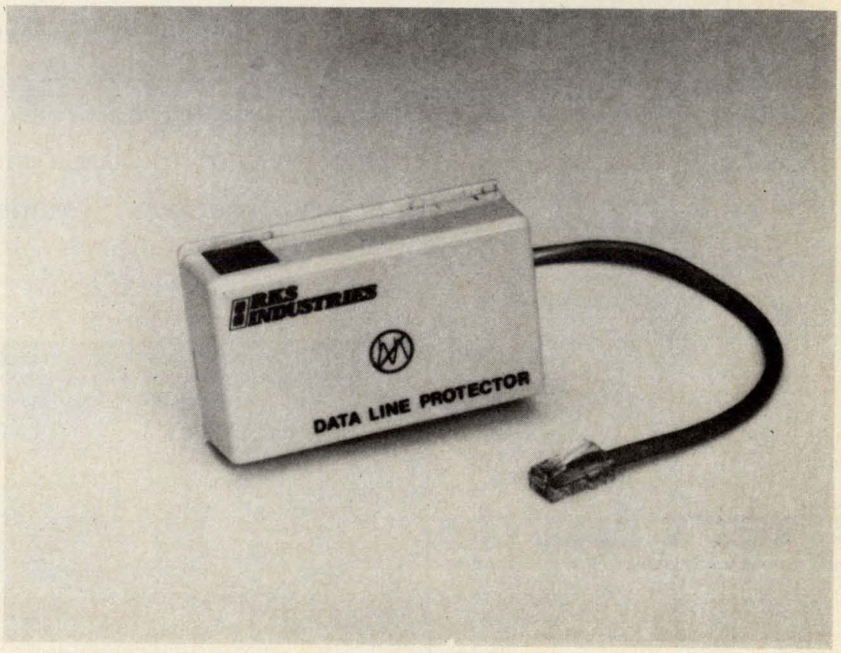
Here is an easy way for you to get manufacturers' information about products advertised or mentioned. Circle the numbers on the card that correspond to key numbers at bottom of advertisements and fill out and mail the postage paid card and the literature will be sent to you free of charge.

Surge Protection

RKS Industries (Scotts Valley, CA) offers the SurgeSentry data line protector for protection against power surges, static, and interference from electrical storms that can occur over communications lines. The data line protector monitors the data line for voltage spikes, and its two-stage power suppression device reacts very fast to spikes to absorb them.

You install the SurgeSentry protector by connecting it to your telephone wall jack, then connecting your modem to the protector using the same type of jack. The device protects the data line into the modem and therefore protects your computer as well. The SurgeSentry retails for $89.50.

Circle number **73** on your reader service card for more information.



Small Business Bookkeeping: Taranto's General Ledger

From no account to my account: how and why I installed Taranto's General Ledger for my repair service and writing business.

by Thomas Howe

Taxes have a way of making record keepers of us all, even for multi-billion dollar corporate conglomerates. Likewise, without taxes, there would be a lot of unemployed accountants. Even our personal finances demand exact accounting to keep our beloved Uncle at arms length.

For me, bookkeeping is time consuming and dreary. My primary reason for buying a personal computer was that I wanted a simpler, easier and quicker way to keep the necessary records. Most of all, I needed something simple. I am not an accountant.

My personal accounting needs are complicated because I have (for tax purposes) three separate businesses that operate using the same checkbook. This means that my financial statement must show three sources of income and three distinct sets of expense records.

The end result must be a single income statement reflecting all these factors and showing a final net income figure that is subject to taxation. It must be detailed enough to withstand an audit without being cumbersome at the same time.

I make my living as a truck mechanic servicing a major trucking company in San Francisco. My primary occupation is the ministry. I am pastor of a small Baptist church in Marin County, CA. I also write computer articles and books. All of these are sources of income and each presents its own special requirements for tax accounting.

NOTE:
In this article we use *THIS typeface* to show exactly what you should type at your keyboard, with the special symbols ↑ for the Control key (CTRL, CNTL or ALT on some keyboards), and ⊃ for the Return key (RET, CR or Carriage Return on some keyboards). We also use This Typeface to show messages displayed by the programs.

Because I operate a one-man shop, I do not have any payroll to contend with. Because I sell a service, I do not have any inventory. Because I generally fly by the seat of my pants and can haul all my assets in a pickup truck, receivables and payables systems are excess baggage. I don't even need a balance sheet. If I can pay all my bills each month, things are balanced enough.

Complex as it may seem, my accounting needs are simple because I need only to produce an income statement and a detailed transaction record. This makes large accounting packages both a burden and an unnecessary expense.

I hope you gain some insights into the software selection process from reading this article. I wanted to show you what one particular system can do.

General Ledger is from Taranto & Associates, 121 Paul Drive, San Rafael, CA (415)472-2670. Retail price $200. The general ledger module is part of a larger system.

Seek And Ye May Find

My search for suitable software led me through many valleys of frustration and taught me a lot about using a computer for bookkeeping. I tried two different systems (I won't name them here) and couldn't get either of them to work. These early efforts dispatched about $400 out the window with no suitable return.

I encountered several basic problems along the way. When I first began, I did not know enough about computers to know what was good or bad. My vendors would not support what they sold. Products with a reputation for quality and versatility were far out of my price range, forcing me to hunt for a low cost solution.

I searched the computer magazines for a new miracle package. Some dealers were not much help as they did not know too much about accounting on the Kaypro II. No one would recommend anything. I was beginning to wonder if my decision to computerize was right.

The magazines ads were enticing, with some offering systems that could do everything but wash the cat. Some had extravagant price tags and others had a price too good to be true. Some ads offered entire systems for $400 and others thought they were worth $500 or more per module. Finding what I needed at a price I could afford proved to be a tough job. At best, I could only hope to stumble onto the right thing.

Then I happened upon something that looked right. There was a small ad tucked away in the back corner of a magazine. What attracted me was that it offered an accounting system one module at a time. I could get only the general ledger without having to buy an entire system.

What made it sound even better was the price — $200. The icing on the cake was that the manufacturer was only ten miles away, close enough for me to bend his ear when I needed help. When I called him, he promised to support his products!

What I found was the General Ledger by Taranto & Associates of San Rafael, California. I visited the company offices and explained what I needed. Mr. Taranto listened patiently and then said his system was just what I needed.

The General Ledger was then only available for TRS-80 and Toshiba computers. Irwin Taranto was gracious enough to download the ledger programs onto my Kaypro and set it up for me. He knew I wrote for computer magazines, but he wanted to set his programs up on a Kaypro because he was beginning to get a number of calls for the Kaypro format.

The real work began sometime later, when I installed the system and used it to do a whole year's worth of bookkeeping.

(You would not believe how fast that stuff can pile up. I was staring at a bushel basket full of receipts and cancelled checks.)

I accomplished a year's bookkeeping in three days. This included the time needed to set the system up and customize it. I posted about 1,000 transactions. The miracle was that it all came out right. I now have a financial statement and transaction report my C.P.A. can use to fill out reams of tax forms.

What Have I Found?

The General Ledger is a basic, uncomplicated ledger system designed for business use. It cares not a whit if your business is large or small. The customized system you eventually establish is completely your own. You take the software and design it to suit yourself.

Written in Microsoft BASIC (Compiler version), this is a collection of about 20 programs. They all work together as a unit. They load and unload themselves as you change functions, like most programs written in BASIC.

The system is password protected to safeguard your confidential data. You establish your own four letter password and can change it any time you wish.

The entire system is driven from a menu with a choice of ten functions. Each function is a step in the accounting process. The menu segment is the central hub to which you always return before going on another step.

The chart of accounts is the heart of the system. It is here that you design exactly what you need. This listing determines the shape of your reports and which figures get added to produce the totals. Begin here to start building your system.

You can post data to the ledger via a cash journal transaction or by direct posting. The cash journal is handy because you can post to both your balance sheet accounts and your actual cash accounts. Direct posting is handy because it allows you to post corrections to one side or the other of an account.

As you post, you can enter a reference number for each transaction. This, along with a description (23 character maximum), allows detailed cross referencing. You can build a sophisticated audit trail if you need it.

In any case, you can stop posting and print out a record of your postings as you go. This is handy if you lose your place in a large pile of work. The audit trail becomes more detailed as a similar set of entries will be printed later.

You may also elect to set up a budget chart of accounts if your business is that complex. These budget amounts will be printed on reports so you can check your progress. You can even see the percentage relationships between the budgeted and actual figures.

The bottom line figures appear on the reports. You can choose from a variety of income sheets and balance sheets. The trial level reports are good for mid-month forecasting. You can also design special reports that will show only selected items.

Reports can be printed on two levels. There is the trial level where you check your progress. There is also the completion level where you close out a month, quarter, or year. This level locks out the data from updating and causes a new month to begin.

Posted data is stored on disk as you post, unlike many other systems that retain posted data in memory and store the posted data on disk only when you do a "save" operation. With Taranto's General Ledger, each posting is done independently, and your chances of losing work are much less. Power failures are not quite so worrisome.

Once you have posted your transactions, the data is processed through several phases of consolidation on its way to a final report. As it passes through a "gate" into the next phase, that "gate" closes, preventing backtracking. Each step produces its own reports.

Installation

The preliminary work required to set up the ledger (and all the other modules Taranto offers) is somewhat technical. You have to know something about computers and accounting. However, once the system is running, anyone should be able to post data and produce reports.

To install the system, first copy the supplied disk and store it safely out of harm's way. Although this is not recommended in the manual, it is good practice with any software.

Assuming you have a two-drive CP/M system, copy SUBMIT.COM, PIP.COM, and BRUN.COM onto a blank, formatted disk.

Place your copy of the supplied disk into drive B and your new disk into drive A. Then type *SUBMIT B:INIT1*⏎ . The supplied submit file does the installation.

The first thing that happens is that PIP copies the entire distribution disk onto the disk in drive A. You are then asked to select your terminal definitions, enter printer control codes, and make disk file assignments in this operation.

Terminal and Printer Installation

Because the Kaypro II emulates, but is not an exact replica of the ADM-3A terminal, the earlier version of General Ledger that I tried required me to enter the terminal controls manually. This has since been corrected to simplify installation.

A 132 column printer is expected. Lacking this, you have the option of using compressed type to fit everything into 80 columns. Refer to your printer manual for the printer codes to set compressed type on and off, then enter the codes during this installation process.

Disk/File Assignments

If your disk drives have enough space, you can store your data on the same disk as the software. If not, or if you wish to have separate data disks for archives, you should opt for two-disk operation.

Two-disk operation is preferred because is is simpler to keep track of your records. Indeed, if you have several of the other modules and eight-inch disk drives, you will need to have the software in the default drive so you can shift from one module to another with less fuss.

The ledger software by itself fills a Kaypro II disk. For the Kaypro II, it works nicely with all programs on drive A and data on drive B. Because the data is compressed, you could use one disk on the Kaypro 4.

Once you complete this operation, the program returns control to the operating system. Now you place your newly created system disk into drive A. Place a blank, formatted disk in drive B. Then type *SUBMIT INIT2*⏎ . PIP copies the designated data files to drive B. You also set up your password during this operation.

Having done this, the system is ready to run. The real work is about to begin.

Setting Up a Chart of Accounts

Though I am fairly well versed on my Kaypro, I know very little about accounting. My major difficulties came in designing my chart of accounts and setting up the income statement. The system installation described above was relatively simple compared to this procedure.

The chart of accounts is the single most important part of your system. It is here that you list by name and number every account of your bookkeeping system. You declare all your divisions and set up all your sub-totals and totals. Once this work is correct, there is very little you have to do to make everything else work properly.

Mr. Taranto has thoughtfully provided a work sheet for designing your chart of accounts. This work sheet (included in the manual) is intended to be copied as you can only list 21 accounts per sheet. You have to list all the particulars about each account. This is to make actual entry easier. (You draw your own road map.)

I am also grateful to Mr. Taranto for his help with my chart of accounts. He is an accountant as well as a programmer. He walked me through devising the chart of accounts by phone. I probably wore out his ear, but within a half day I had this system working. Support is important and I finally found some!

There are six types of accounts. The most important are the REGULAR accounts. These are the only ones you can post transactions to. The others are only accessible to the software and are used to produce totals, headings, and dashes.

I have reproduced a portion of my chart of accounts (figure 1) so you can see how it is developed. Although I will never need a balance sheet, balance sheet accounts are necessary, and in figure 1 you can see that I installed the balance sheet accounts as simple numbers at the top of the chart.

As you study figure 1, you can see that a lot of information is required for each account. Using the fifth menu item, ACCOUNT FILE MAINTENANCE, you enter the information as shown from left to right across the columns.

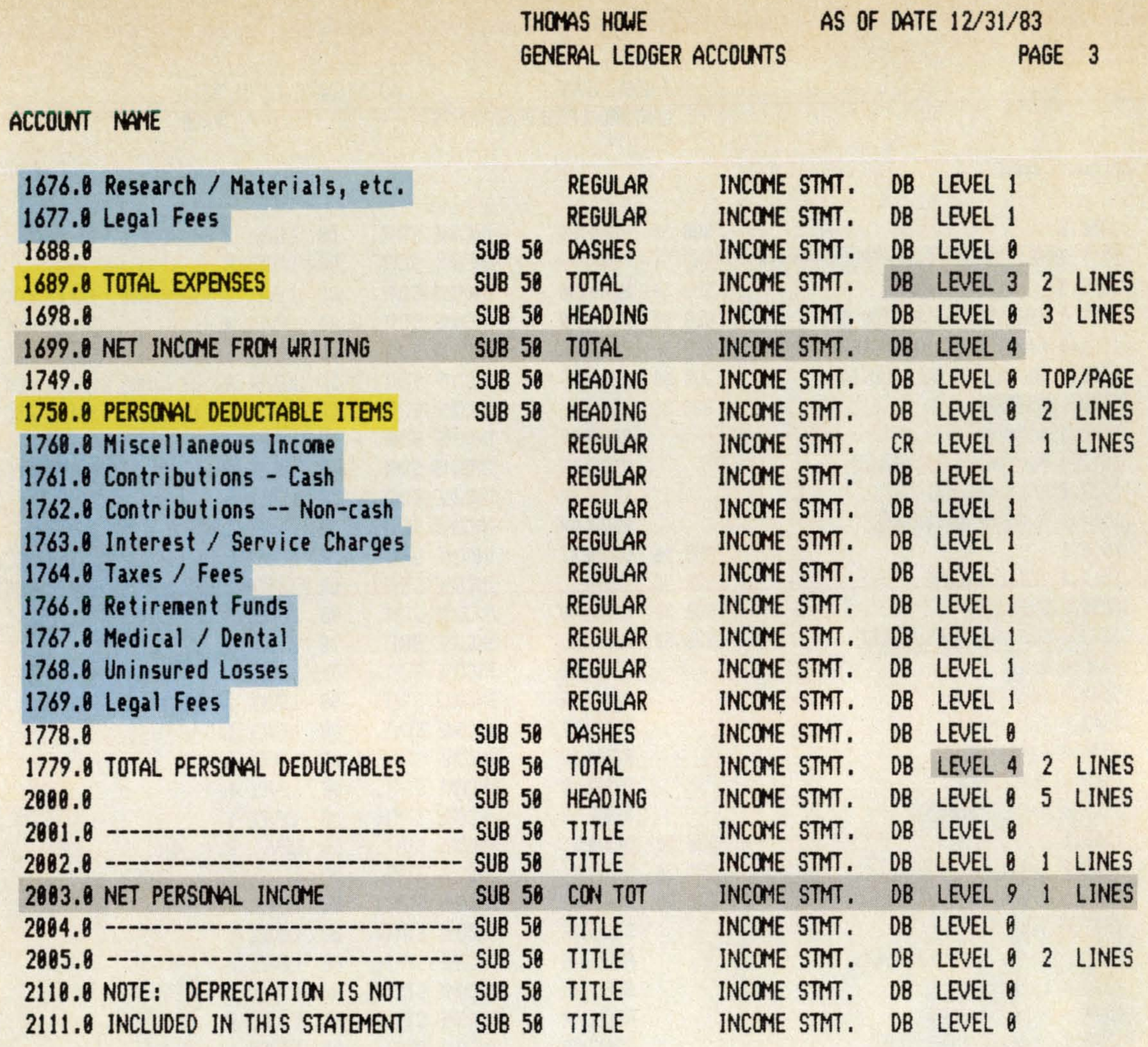
For the books to "balance" and produce correct totals, I post all transactions as debits to account number 1.0 (cash balance account) and as a debit or credit (according to whether it is income or expenses) to the rest of the accounts.

For visibility while entering data, I color-coded my chart of accounts (as shown in figure 1). Regular accounts (where data is posted) are blue. This makes it easier to find the correct account number when there are too

Continued on page 30

```
                                        THOMAS HOWE           AS OF DATE 12/31/83
                                         GENERAL LEDGER ACCOUNTS                PAGE  1

ACCOUNT  NAME

   1.0 CASH BALANCE ACCOUNT                    REGULAR    BALANCE SHEET  DB  LEVEL 0
   2.0 RETAINED EARNINGS                       REGULAR    BALANCE SHEET  DB  LEVEL 0
1001.0 TRUCK REPAIR BUSINESS           SUB 50  HEADING    INCOME STMT.   CR  LEVEL 0  2  LINES  SALES ACCT
1003.0 INCOME                          SUB 50  TITLE      INCOME STMT.   CR  LEVEL 0  1  LINES  SALES ACCT
1010.0 Truck Repair                            REGULAR    INCOME STMT.   CR  LEVEL 1            SALES ACCT
1020.0 Cash Income                             REGULAR    INCOME STMT.   CR  LEVEL 1            SALES ACCT
1090.0                                 SUB 50  DASHES     INCOME STMT.   CR  LEVEL 0            SALES ACCT
1091.0 TOTAL INCOME                    SUB 50  TOTAL      INCOME STMT.   CR  LEVEL 3  3  LINES  SALES ACCT
1097.0 EXPENSES                        SUB 50  HEADING    INCOME STMT.   DB  LEVEL 0  1  LINES
1110.0 Shop Truck Expenses             SUB 50  HEADING    INCOME STMT.   DB  LEVEL 1
1111.0 Purchase / Payments                     REGULAR    INCOME STMT.   DB  LEVEL 1
1112.0 Fuel / Oil                              REGULAR    INCOME STMT.   DB  LEVEL 1
1113.0 Maintenence / Repairs                   REGULAR    INCOME STMT.   DB  LEVEL 1
1114.0 Lisences / Fees                         REGULAR    INCOME STMT.   DB  LEVEL 1
1115.0 Bridge Tolls                            REGULAR    INCOME STMT.   DB  LEVEL 1
1119.0 Miscellaneous Expenses                  REGULAR    INCOME STMT.   DB  LEVEL 1
1130.0                                 SUB 50  DASHES     INCOME STMT.   DB  LEVEL 0
1131.0 Total                           SUB 50  TOTAL      INCOME STMT.   DB  LEVEL 2  1  LINES
1150.0 Shop Operations                 SUB 50  HEADING    INCOME STMT.   DB  LEVEL 1
1151.0 Supplies                                REGULAR    INCOME STMT.   DB  LEVEL 1
1152.0 Tools / Equipment                       REGULAR    INCOME STMT.   DB  LEVEL 1
1153.0 Maintence / Repairs                     REGULAR    INCOME STMT.   DB  LEVEL 1
1154.0 Manuals / Publications                  REGULAR    INCOME STMT.   DB  LEVEL 1
1155.0 Contract Labor                          REGULAR    INCOME STMT.   DB  LEVEL 1
1156.0 Uniforms                                REGULAR    INCOME STMT.   DB  LEVEL 1
1157.0 Parts                                   REGULAR    INCOME STMT.   DB  LEVEL 1
1181.0                                 SUB 50  DASHES     INCOME STMT.   DB  LEVEL 0
1182.0 Total                           SUB 50  TOTAL      INCOME STMT.   DB  LEVEL 2  1  LINES
1200.0 Insurance                       SUB 50  HEADING    INCOME STMT.   DB  LEVEL 1
1201.0 Shop Truck Insurance                    REGULAR    INCOME STMT.   DB  LEVEL 1
1202.0 Business Insurance                      REGULAR    INCOME STMT.   DB  LEVEL 1
1203.0 Uninsured Losses                        REGULAR    INCOME STMT.   DB  LEVEL 1
1208.0                                 SUB 50  DASHES     INCOME STMT.   DB  LEVEL 0
1209.0 Total                           SUB 50  TOTAL      INCOME STMT.   DB  LEVEL 2  1  LINES
1220.0 Office Operations               SUB 50  HEADING    INCOME STMT.   DB  LEVEL 1
1221.0 Equipment                               REGULAR    INCOME STMT.   DB  LEVEL 1
1222.0 Supplies                                REGULAR    INCOME STMT.   DB  LEVEL 1
1223.0 Telephone                               REGULAR    INCOME STMT.   DB  LEVEL 1
1224.0 Utilities                               REGULAR    INCOME STMT.   DB  LEVEL 1
1225.0 Labor                                   REGULAR    INCOME STMT.   DB  LEVEL 1
1226.0 Repairs                                 REGULAR    INCOME STMT.   DB  LEVEL 1
1227.0 Postage                                 REGULAR    INCOME STMT.   DB  LEVEL 1
1228.0 Publications / Journals                 REGULAR    INCOME STMT.   DB  LEVEL 1
1229.0 Accounting Fees                         REGULAR    INCOME STMT.   DB  LEVEL 1
1248.0                                 SUB 50  DASHES     INCOME STMT.   DB  LEVEL 0
1249.0 Total                           SUB 50  TOTAL      INCOME STMT.   DB  LEVEL 2  1  LINES
1300.0 Miscellaneous Expenses          SUB 50  HEADING    INCOME STMT.   DB  LEVEL 1
1301.0 Entertainment                           REGULAR    INCOME STMT.   DB  LEVEL 1
1302.0 Miscellaneous                           REGULAR    INCOME STMT.   DB  LEVEL 1
1303.0 Legal Fees                              REGULAR    INCOME STMT.   DB  LEVEL 1
1308.0                                 SUB 50  DASHES     INCOME STMT.   DB  LEVEL 0
1309.0 Total                           SUB 50  TOTAL      INCOME STMT.   DB  LEVEL 2  1  LINES
1340.0                                 SUB 50  HEADING    INCOME STMT.   DB  LEVEL 0  2  LINES
1341.0 TOTAL EXPENSES                  SUB 50  TOTAL      INCOME STMT.   DB  LEVEL 3
```

```
                                THOMAS HOWE              AS OF DATE 12/31/83
                                GENERAL LEDGER ACCOUNTS               PAGE  2

ACCOUNT  NAME

 1350.0                             SUB 50  HEADING    INCOME STMT.  DB  LEVEL 0  5  LINES
 1351.0 NET INCOME FROM TRUCK REPAIR SUB 50  TOTAL      INCOME STMT.  DB  LEVEL 4
 1499.0                             SUB 50  HEADING    INCOME STMT.  DB  LEVEL 0  TOP/PAGE  SALES ACCT
 1500.0 MINISTRY -- PASTOR OF       SUB 50  HEADING    INCOME STMT.  DB  LEVEL 0            SALES ACCT
 1501.0 FIRST BAPTIST CHURCH        SUB 50  HEADING    INCOME STMT.  DB  LEVEL 0            SALES ACCT
 1502.0 SAUSALITO CALIFORNIA        SUB 50  HEADING    INCOME STMT.  CR  LEVEL 0  1  LINES  SALES ACCT
 1510.0 INCOME                      SUB 50  TITLE      INCOME STMT.  CR  LEVEL 0  1  LINES  SALES ACCT
 1511.0 Salary                              REGULAR    INCOME STMT.  CR  LEVEL 1
 1512.0 Parsonage Allowance                 REGULAR    INCOME STMT.  CR  LEVEL 1            SALES ACCT
 1513.0 Professional Fees                   REGULAR    INCOME STMT.  CR  LEVEL 1
 1514.0 Gifts / Offerings                   REGULAR    INCOME STMT.  CR  LEVEL 1
 1518.0                             SUB 50  DASHES     INCOME STMT.  CR  LEVEL 0            SALES ACCT
 1519.0 TOTAL INCOME                SUB 50  TOTAL      INCOME STMT.  CR  LEVEL 3  3  LINES  SALES ACCT
 1530.0 EXPENSES                    SUB 50  HEADING    INCOME STMT.  DB  LEVEL 0  1  LINES
 1540.0 Parsonage Expenses          SUB 50  HEADING    INCOME STMT.  DB  LEVEL 1
 1541.0 Rent                                REGULAR    INCOME STMT.  DB  LEVEL 1
 1542.0 Utilities                           REGULAR    INCOME STMT.  DB  LEVEL 1
 1543.0 Telephone                           REGULAR    INCOME STMT.  DB  LEVEL 1
 1544.0 Furnishings                         REGULAR    INCOME STMT.  DB  LEVEL 1
 1545.0 Insurance                           REGULAR    INCOME STMT.  DB  LEVEL 1
 1546.0 Miscellaneous                       REGULAR    INCOME STMT.  DB  LEVEL 1
 1558.0                             SUB 50  DASHES     INCOME STMT.  DB  LEVEL 0
 1559.0 Total                       SUB 50  TOTAL      INCOME STMT.  DB  LEVEL 2  1  LINES
 1568.0 Miscellaneous Expenses      SUB 50  HEADING    INCOME STMT.  DB  LEVEL 0
 1571.0 Supplies                            REGULAR    INCOME STMT.  DB  LEVEL 1
 1572.0 Books / Periodicals                 REGULAR    INCOME STMT.  DB  LEVEL 1
 1573.0 Entertaining                        REGULAR    INCOME STMT.  DB  LEVEL 1
 1574.0 Benevolences                        REGULAR    INCOME STMT.  DB  LEVEL 1
 1575.0 Special Ministrys                   REGULAR    INCOME STMT.  DB  LEVEL 1
 1576.0 Insurance                           REGULAR    INCOME STMT.  DB  LEVEL 1
 1577.0 Uninsured Losses                    REGULAR    INCOME STMT.  DB  LEVEL 1
 1578.0 Legal Fees                          REGULAR    INCOME STMT.  DB  LEVEL 1
 1580.0 Miscellaneous Expenses              REGULAR    INCOME STMT.  DB  LEVEL 1
 1588.0                             SUB 50  DASHES     INCOME STMT.  DB  LEVEL 0
 1589.0 Total                       SUB 50  TOTAL      INCOME STMT.  DB  LEVEL 2
 1595.0                             SUB 50  HEADING    INCOME STMT.  DB  LEVEL 0  2  LINES
 1596.0 TOTAL EXPENSES              SUB 50  TOTAL      INCOME STMT.  DB  LEVEL 3  2  LINES
 1640.0                             SUB 50  HEADING    INCOME STMT.  DB  LEVEL 0  3  LINES
 1641.0 NET MINISTRY INCOME         SUB 50  TOTAL      INCOME STMT.  DB  LEVEL 4
 1649.0                             SUB 50  HEADING    INCOME STMT.  CR  LEVEL 0  TOP/PAGE  SALES ACCT
 1650.0 WRITING                     SUB 50  TITLE      INCOME STMT.  CR  LEVEL 1  1  LINES  SALES ACCT
 1654.0 INCOME                      SUB 50  TITLE      INCOME STMT.  CR  LEVEL 1  1  LINES  SALES ACCT
 1655.0 Fees                                REGULAR    INCOME STMT.  CR  LEVEL 1
 1656.0 Advances                            REGULAR    INCOME STMT.  CR  LEVEL 1
 1657.0 Royalties                           REGULAR    INCOME STMT.  CR  LEVEL 1
 1658.0 Miscellaneous                       REGULAR    INCOME STMT.  CR  LEVEL 1
 1659.0                             SUB 50  DASHES     INCOME STMT.  CR  LEVEL 0
 1660.0 TOTAL INCOME                SUB 50  TOTAL      INCOME STMT.  CR  LEVEL 3  3  LINES  SALES ACCT
 1668.0 EXPENSES                    SUB 50  HEADING    INCOME STMT.  DB  LEVEL 0  1  LINES
 1670.0 Supplies                            REGULAR    INCOME STMT.  DB  LEVEL 1
 1672.0 Postage                             REGULAR    INCOME STMT.  DB  LEVEL 1
 1673.0 Telephone                           REGULAR    INCOME STMT.  DB  LEVEL 1
 1674.0 Agent's Fees                        REGULAR    INCOME STMT.  DB  LEVEL 1
 1675.0 Miscellaneous Fees                  REGULAR    INCOME STMT.  DB  LEVEL 1
```



```
                                      THOMAS HOWE                AS OF DATE 12/31/83
                                      GENERAL LEDGER ACCOUNTS                 PAGE  3

ACCOUNT  NAME

1676.0 Research / Materials, etc.             REGULAR      INCOME STMT.   DB  LEVEL 1
1677.0 Legal Fees                             REGULAR      INCOME STMT.   DB  LEVEL 1
1688.0                                 SUB 50 DASHES       INCOME STMT.   DB  LEVEL 0
1689.0 TOTAL EXPENSES                  SUB 50 TOTAL        INCOME STMT.   DB  LEVEL 3  2  LINES
1698.0                                 SUB 50 HEADING      INCOME STMT.   DB  LEVEL 0  3  LINES
1699.0 NET INCOME FROM WRITING         SUB 50 TOTAL        INCOME STMT.   DB  LEVEL 4
1749.0                                 SUB 50 HEADING      INCOME STMT.   DB  LEVEL 0  TOP/PAGE
1750.0 PERSONAL DEDUCTABLE ITEMS       SUB 50 HEADING      INCOME STMT.   DB  LEVEL 0  2  LINES
1760.0 Miscellaneous Income                   REGULAR      INCOME STMT.   CR  LEVEL 1  1  LINES
1761.0 Contributions - Cash                   REGULAR      INCOME STMT.   DB  LEVEL 1
1762.0 Contributions -- Non-cash              REGULAR      INCOME STMT.   DB  LEVEL 1
1763.0 Interest / Service Charges             REGULAR      INCOME STMT.   DB  LEVEL 1
1764.0 Taxes / Fees                           REGULAR      INCOME STMT.   DB  LEVEL 1
1766.0 Retirement Funds                       REGULAR      INCOME STMT.   DB  LEVEL 1
1767.0 Medical / Dental                       REGULAR      INCOME STMT.   DB  LEVEL 1
1768.0 Uninsured Losses                       REGULAR      INCOME STMT.   DB  LEVEL 1
1769.0 Legal Fees                             REGULAR      INCOME STMT.   DB  LEVEL 1
1778.0                                 SUB 50 DASHES       INCOME STMT.   DB  LEVEL 0
1779.0 TOTAL PERSONAL DEDUCTABLES      SUB 50 TOTAL        INCOME STMT.   DB  LEVEL 4  2  LINES
2000.0                                 SUB 50 HEADING      INCOME STMT.   DB  LEVEL 0  5  LINES
2001.0 ------------------------------- SUB 50 TITLE        INCOME STMT.   DB  LEVEL 0
2002.0 ------------------------------- SUB 50 TITLE        INCOME STMT.   DB  LEVEL 0  1  LINES
2003.0 NET PERSONAL INCOME             SUB 50 CON TOT      INCOME STMT.   DB  LEVEL 9  1  LINES
2004.0 ------------------------------- SUB 50 TITLE        INCOME STMT.   DB  LEVEL 0
2005.0 ------------------------------- SUB 50 TITLE        INCOME STMT.   DB  LEVEL 0  2  LINES
2110.0 NOTE:  DEPRECIATION IS NOT      SUB 50 TITLE        INCOME STMT.   DB  LEVEL 0
2111.0 INCLUDED IN THIS STATEMENT      SUB 50 TITLE        INCOME STMT.   DB  LEVEL 0
```

Figure 1. *Color-coded chart of accounts. Regular accounts are blue. Major headings are green, division headings are yellow, and total lines and levels are in grey.*

many to remember.

Major headings are green. Division headings are mellow yellow. Total lines and total levels are marked in grey. (When you're broke as I am, money green is hard to come by!)

I placed a copy of this chart in protective plastic sleeves along with a copy of a trial income statement. These are placed in the front of the system manual (a loose-leaf notebook) for easy reference.

You can print your chart of accounts during the account maintenance phase. You may print either this list showing only account numbers and descriptions or you may print a listing that includes totals. A shorter listing of my chart of accounts takes 2.5 pages while the long version requires about 9 pages.

You will notice that I have left a lot of room between divisions in my numbering system. This allows for expansion later on without having to overhaul the whole system.

I appreciated this space early in this process when I discovered that account 1157.0 was missing. I had to insert a place to post parts purchases. How can a mechanic operate without buying parts?

The total levels you see in the seventh column establish the hierarchy for totaling. I designated all regular accounts (accounts you can post data to) as LEVEL 1. The first set of sub-totals are LEVEL 2. Gross income and gross expenses are all LEVEL 3. "Division" totals are all LEVEL 4. (The "division" totals are used to separate my three businesses.)

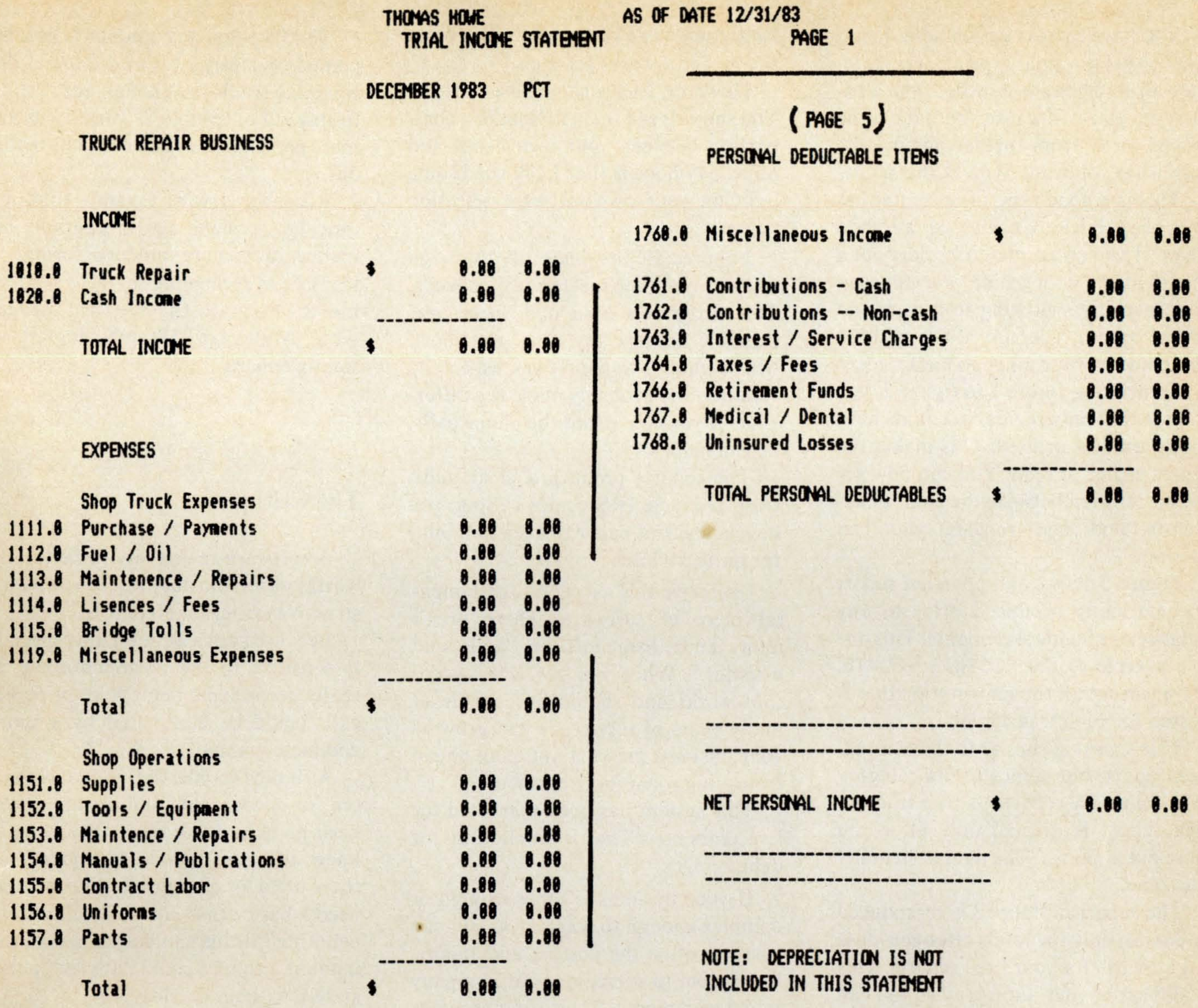
The final net income figure is computed at LEVEL 9 because this reconciles all additions (income) and subtractions (expenses). This level reconciles the entire statement.

Nine total levels are available. Use of higher numbers will cause inclusive totaling of all previous data that has lower total levels. LEVEL 9 is reserved for your final overall total.

Report Development

Refer to figure 2 for the resulting trial income statement. I have zeroed all amounts due to the personal nature of the information, but you can get a general idea of how it works. Reproduced are a portion of page one and all of page five where the final totals are computed. Your report can be as long or as short as you need.

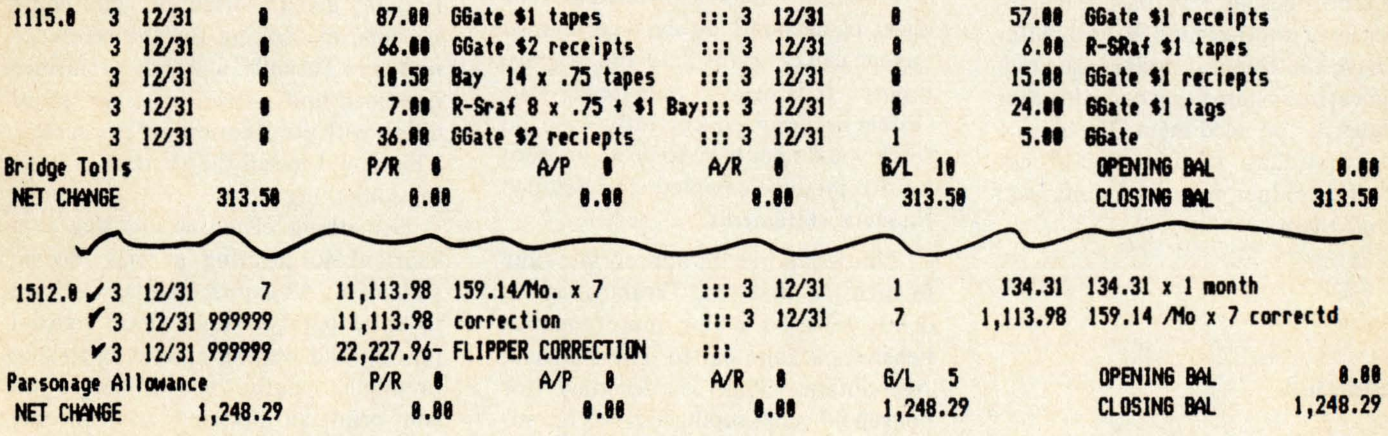
Figure 2 is a sample of my income statement. It was printed by using the REPORTS option of the main menu. You are first asked which level and type of report you need.



```
                              THOMAS HOWE              AS OF DATE 12/31/83
                               TRIAL INCOME STATEMENT              PAGE 1

                             DECEMBER 1983    PCT

       TRUCK REPAIR BUSINESS


       INCOME

1010.0 Truck Repair                   $        0.00   0.00
1020.0 Cash Income                             0.00   0.00
                                      --------------
       TOTAL INCOME                   $        0.00   0.00



       EXPENSES

       Shop Truck Expenses
1111.0 Purchase / Payments                     0.00   0.00
1112.0 Fuel / Oil                              0.00   0.00
1113.0 Maintenence / Repairs                   0.00   0.00
1114.0 Lisences / Fees                         0.00   0.00
1115.0 Bridge Tolls                            0.00   0.00
1119.0 Miscellaneous Expenses                  0.00   0.00
                                      --------------
       Total                          $        0.00   0.00

       Shop Operations
1151.0 Supplies                                0.00   0.00
1152.0 Tools / Equipment                       0.00   0.00
1153.0 Maintence / Repairs                     0.00   0.00
1154.0 Manuals / Publications                  0.00   0.00
1155.0 Contract Labor                          0.00   0.00
1156.0 Uniforms                                0.00   0.00
1157.0 Parts                                   0.00   0.00
                                      --------------
       Total                          $        0.00   0.00
```

```
                  ( PAGE 5 )
       PERSONAL DEDUCTABLE ITEMS

1760.0 Miscellaneous Income           $        0.00   0.00

1761.0 Contributions - Cash                    0.00   0.00
1762.0 Contributions -- Non-cash               0.00   0.00
1763.0 Interest / Service Charges              0.00   0.00
1764.0 Taxes / Fees                            0.00   0.00
1766.0 Retirement Funds                        0.00   0.00
1767.0 Medical / Dental                        0.00   0.00
1768.0 Uninsured Losses                        0.00   0.00
                                      --------------
       TOTAL PERSONAL DEDUCTABLES     $        0.00   0.00



       -------------------------------
       -------------------------------

       NET PERSONAL INCOME            $        0.00   0.00

       -------------------------------
       -------------------------------


       NOTE:  DEPRECIATION IS NOT
       INCLUDED IN THIS STATEMENT
```

Figure 2. *Segments of a trial income statement printed using the REPORTS option of the main menu. Account numbers match accounts in figure 1. (Amounts are zeroed for privacy.)*



```
1115.0  3  12/31      0        87.00  GGate $1 tapes         ::: 3  12/31    0         57.00  GGate $1 receipts
        3  12/31      0        66.00  GGate $2 receipts      ::: 3  12/31    0          6.00  R-SRaf $1 tapes
        3  12/31      0        10.50  Bay  14 x .75 tapes    ::: 3  12/31    0         15.00  GGate $1 reciepts
        3  12/31      0         7.00  R-Sraf 8 x .75 + $1 Bay::: 3  12/31    0         24.00  GGate $1 tags
        3  12/31      0        36.00  GGate $2 reciepts      ::: 3  12/31    1          5.00  GGate
Bridge Tolls              P/R  0         A/P  0         A/R  0         G/L  10          OPENING BAL         0.00
NET CHANGE       313.50       0.00           0.00           0.00        313.50          CLOSING BAL       313.50

1512.0 ✓3  12/31      7    11,113.98  159.14/Mo. x 7         ::: 3  12/31    1        134.31  134.31 x 1 month
       ✓3  12/31 999999    11,113.98  correction             ::: 3  12/31    7      1,113.98  159.14 /Mo x 7 correctd
       ✓3  12/31 999999    22,227.96- FLIPPER CORRECTION     :::
Parsonage Allowance       P/R  0         A/P  0         A/R  0         G/L  5           OPENING BAL         0.00
NET CHANGE     1,248.29       0.00           0.00           0.00      1,248.29          CLOSING BAL     1,248.29
```

Figure 3. *Segment of the posting update report automatically produced prior to any balance or income statements. Here you see all the information that is posted for each transaction. This report is a preliminary to a true transaction report that is printed only after you close out a month.*

You have to use caution here. If you elect to print a final type income statement or balance sheet rather than a trial type, you will cause the data to be locked away from further posting. Be sure what you want to do at this point.

This is a good time to reiterate that you need backup copies of all data disks. If you do accidentally close out a month at the wrong time, you can easily recover by switching to a copy and trying again. You are stuck without this copy as you cannot go back.

Comparing figure 1 to figure 2, you can see that only regular accounts have their numbers printed. This makes the report easier to read. You can now see the correlation between the chart of accounts and the reports you can produce.

Figure 3 shows an important report automatically produced prior to any balance or income statements. This one is a sample of the POSTING UPDATE. Here you see all the information that is posted for each transaction.

This report is similar to the transaction report, but comes in the category of preliminary reports. A true transaction report is printed only after you close out a month. The data is virtually the same.

The report in figure 3 is reproduced later with only the totals after you close out a month for your final reports. This is all part of your audit trail so you can trace transactions through the entire system. Save all this paperwork.

Something else you might notice is that the report in figure 3 can also include totals from other modules such as Receivables or Payables. This reminds us of another nice feature. After you have the General Ledger (the hub of the entire system), you can add other modules as you need them. There is no need to purchase modules you do not need. The ledger functions quite well without them.

Evaluation

I am not an accountant, therefore I should not make rash statements on the merits or faults of this software from an accountant's viewpoint. What I can say is that it works for me.

However, I have some observations. You should read them in light of a comparison between your own needs and mine. My hope is that I can shed some light on your own software selection process.

I appreciate the flexibility to design my own system to meet my exact needs. This program's ease and speed was valuable because my time was short. Mr. Taranto's support was especially valuable and probably made the difference. If you can afford the phone calls, he can help.

The reports produce a clear audit trail. If Uncle IRS comes calling, you have a stack of paper to keep him busy for quite a while.

I perceive this as a solid fundamental piece of software. There aren't many embellishments or "bells and whistles." What you get is a system that works and should be capable of many years of service. It can grow as your business grows if you plan ahead by leaving room for expansion.

This system has been marketed for five years now. That is ample time for debugging.

If your business is large enough or complex enough to warrant it, you can further refine the posting and reporting system to segregate your company into departments. Thus, if plant maintenance needs to be separated from shipping to give you the required perspective, you can do it. The flexibility is there.

Once the system is installed and the chart of accounts established, almost anyone can enter the data and produce reports. It is easy to operate. If your system is designed correctly (you do this), you do not have to be an accountant to produce complete and detailed financial statements.

This seems like the appropriate time to mention that Mr. Taranto has recently released a new, more comprehensive package called The Personal Accountant. This is designed for household bookkeeping and has a complete chart of accounts already built in. The chart of accounts can be modified to suit your own personal needs.

The Personal Accountant is accompanied by a large tutorial manual designed to teach you enough accounting to stay out of trouble. If your needs are more personal than business, check this out.

Recently, Irwin Taranto told me that he is planning to upgrade his menus to a more modern format. I think he is even going to make it possible to integrate the General Ledger with Multiplan. Watch for these improvements.

The Critique

A software review would be totally worthless if it did not present some constructive criticism. Here it is.

Because I am a writer, I am especially sensitive to the documentation. It really needs some help. A lot of phone calls could be eliminated by a more complete manual.

As it now stands, the manual is written for accountants and assumes they need no help doing what they already know all about. Don't you agree that there are a lot of dummies like me who need a basic crash course in simple accounting? If this had been a part of the manual, I think I could have set up this system without outside help.

There is at least one embellishment I would find valuable. Since I am prone to wait until I have a lot of posting piled up, it would be very handy if I could have the system search its records to find any given transaction. This could be done by looking for the reference numbers (usually a check or invoice number) and presenting the record along with its location on the screen. This would lessen the chances of posting something twice.

Something else I would like is a shortcut to printing a trial income statement. As it now stands, you have to close out two steps (cash journal posting and posting update, each step producing lengthy reports) before you can print an updated trial income statement. There is probably nothing wrong with this, but I find it a little annoying.

Another thing I would find helpful would be the ability to manually enter the journal at any point and delete a transaction. In figure 3, there is a gross mistake in posting income for my parsonage allowance to account 1512.0.

I doubled the mistake the first time I tried to correct it. The entry labeled FLIPPER CORRECTION clears it up, but it drives my C.P.A. bananas. If I could directly access a given transaction and alter or delete it after it is stored, this whole mess would have been eliminated.

The FLIPPER CORRECTION is a bit of un-conventional accounting practice I devised to correct mistakes. What it amounts to is simply ciphering the exact amount of the error (with a pocket calculator) and using the DIRECT POSTING option of the main menu to enter an amount sufficient to cancel the error. When I make a mistake, I just "flip 'er over."

You want to clearly mark these so auditors will not become confused. Also, mark the entries used to restore balance (the last entry in the second column).

Selecting Accounting Software

This is intentionally not your average software review. I have written it with a great deal of personal detail so you could look over my shoulder as I wandered through the abyss of software selection.

By seeing my mistakes and what I did to correct them, I hope to point out some important things that have to figure into your software selection.

You have to know what kind of business you are in. This may sound dumb, but it really isn't. In the business world, almost every thing you do has a direct impact on your taxable income. The way you do whatever it is you do determines the special accounting needs you have. No two of us are alike.

If you have a large credit business or are serviced by lots of different vendors, you will need Receivables and Payables. As a one-man shop, I don't need the Payroll module — you might. If your business is a retail store, you will need the Inventory module to keep up with your stock orders. Just what is it you do?

This also points up that you need to determine the exact level of sophistication you need. If you have a complex business, you may all the modules. If you don't need a module, don't buy excess baggage and headaches. Streamline so time and money are not wasted.

You also have to know how much you can afford to spend on mistakes. Seriously, you have to allow for this. If you are a normal human, you will goof at least once in a while. Plan an escape route (be sure your bosses are forewarned of the possibility) so you can dive for cover when the need arises. Escape routes are built into the General Ledger.

What I did not do was spend enough time early on doing research to determine which ledger program would meet my needs. As you recall from previous discussion, I needed something simple yet flexible. It also had to be relatively easy to set up. I bought my first systems too soon and discovered too late that they were clumsy and would not perform as I expected.

One thing I have not yet mentioned was that I needed something that would write invoices with a large amount of text. Since most receivables programs are designed for point-of-sale usage, I haven't found one yet to master this requirement. I use a text editing program for that job, but cannot integrate it with my ledger. Do your homework.

Look for dealer or vendor support. If either the company that markets the software or the dealer who sells it can't or won't help you when there is trouble — you don't need their software. Buy it somewhere else. There are hundreds of vendors to choose from, and I insist that they compete for my business. Be careful when vendors refer you to consultants (at $60 to $300 per hour) rather than provide basic support.

Along these same lines, don't believe everything you see, read, or hear. A healthy amount of skepticism will keep you from stumbling blindly into an open pit. Buy software like you were buying a used car!

File LOG

At last — an easy-to-use utility to help you keep track of all those files on your busy system!

A MUST FOR:
- **Programmers**
- **Spreadsheet users**
- **Word processors**
- **Anyone who continuously creates and updates files**

LOG IS ON-LINE

LOG is right there with your text editing, spreadsheet, word processing and other software. New files and revisions can be LOG'ed without changing disks!

LOG IS FAST AND EASY TO USE.

That's important because you wouldn't use a file logging tool which isn't convenient.

LOG traps errors and shows the results of your commands.

FOR EACH FILE LOGGED you will have a record of:
- date of creation
- date & time of last revision
- your comments (up to 96 characters)

LOG FEATURES:
- catalog entry & maintenance
- read a disk's directory and make entries for files that have not been LOG'ed
- display or print all of the LOG entries sorted by file name
- display LOG entries which match an ambiguous file name
- display LOG entries selected on a date range
- consolidated multi-disk catalog
- can be customized to use your hardware calendar/ clock

Introductory offer
All this for only
$34.95, prepaid.
Ohio residents add 6% sales tax.

LOG is furnished on 8" SSSD disks for CP/M-80 and CP/M-86. Inquire about other media. MS-DOS version available soon.

The LOG System
by
COMPUTER THAUMATURGY, INC.
"What we do with computers is magic!"

1212 Miami Valley Tower
40 West Fourth Street
Dayton, OH 45402
(513) 461-2126

Call us with your order today!

CP/M-80 and CP/M-86 are registered trademarks of Digital Research, Inc. MS-DOS is a registered trademark of Microsoft, Inc.

Circle number 2 on the reader service card.

ASCII Alchemy

A reference chart to the ASCII character set.

Hexadecimal Value

To find the *hexadecimal* value of a character, locate the character and combine the first two digits at the top of the character's column with the third digit in the far left column.

LEGEND:

Character code in decimal
EBCDIC equivalent hexadecimal code

		04_
0	64 7C	@

HEXADECIMAL	00_			01_			02_			03_			04_			05_			06_			07_		
0	0	00	NUL	16	10	DLE ↑P	32	40	SPACE	48	F0	0	64	7C	@	80	D7	P	96	79	` (GRAVE)	112	97	p
1	1	01	SOH ↑A	17	11	DC1 ↑Q	33	5A	!	49	F1	1	65	C1	A	81	D8	Q	97	81	a	113	98	q
2	2	02	STX ↑B	18	12	DC2 ↑R	34	7F	" (QUOTE)	50	F2	2	66	C2	B	82	D9	R	98	82	b	114	99	r
3	3	03	ETX ↑C	19	13	DC3 ↑S	35	7B	#	51	F3	3	67	C3	C	83	E2	S	99	83	c	115	A2	s
4	4	37	EOT ↑D	20	3C	DC4 ↑T	36	5B	$	52	F4	4	68	C4	D	84	E3	T	100	84	d	116	A3	t
5	5	2D	ENQ ↑E	21	3D	NAK ↑U	37	6C	%	53	F5	5	69	65	E	85	E4	U	101	85	e	117	A4	u
6	6	2E	ACK ↑F	22	32	SYN ↑V	38	50	&	54	F6	6	70	C6	F	86	E5	V	102	86	f	118	A5	v
7	7	2F	BEL ↑G	23	26	ETB ↑W	39	7D	' (APOS)	55	F7	7	71	C7	G	87	E6	W	103	87	g	119	A6	w
8	8	16	BS (BACK-SPACE)	24	18	CAN ↑X	40	4D	(	56	F8	8	72	C8	H	88	E7	X	104	88	h	120	A7	x
9	9	05	HT (TAB)	25	19	EM ↑Y	41	5D	)	57	F9	9	73	C9	I	89	E8	Y	105	89	i	121	A8	y
A	10	15	NL (NEW LINE)	26	3F	SUB ↑Z	42	5C	*	58	7A	: (COLON)	74	D1	J	90	E9	Z	106	91	j	122	A9	z
B	11	0B	VT (VERT. TAB)	27	27	ESC (ESCAPE)	43	4E	+	59	5E	; (SEMI)	75	D2	K	91	8D	[	107	92	k	123	C0	{
C	12	06	FF (FORM FEED)	28	1C	FS ↑\	44	6B	, (COMMA)	60	4C	<	76	D3	L	92	EO	\	108	93	l	124	4F	|
D	13	0D	RT (RETURN)	29	1D	CS ↑]	45	60	-	61	7E	=	77	D4	M	93	9D	]	109	94	m	125	D0	}
E	14	0E	SO ↑N	30	1E	RS ↑↑	46	4B	. (PERIOD)	62	6E	>	78	D5	N	94	5F	↑ or ^	110	95	n	126	A1	~ (TILDE)
F	15	0F	SI ↑O	31	1F	US ↑←	47	61	/	63	6F	?	79	D6	O	95	6D	← or _	111	96	o	127	07	DEL (RUBOUT)

↑ means CONTROL

Decimal & EBCDIC

Two other values are supplied with each character: the decimal equivalent to its regular ASCII hexadecimal value, and the EBCDIC hexadecimal value. EBCDIC (Extended Binary Coded Decimal Interchange Code) is used especially with IBM mainframe computers.

Patching With DDT and SAVE

Making auto-startup program disks, setting up user areas, making "patches" to programs and other powerful changes.

by Tony Bove & Cheryl Rhodes

The CP/M-80 system you are using can change itself! That is, a utility program called DDT, provided with your CP/M-80 system, can make changes to the software in memory, including the system itself and any program you may be running. You can then use the SAVE command to save the changed system or program.

Why would you want to change the system? You may want to set up a disk to automatically run a program immediately after initial start-up. With such a disk in drive A, you could press the reset button, and rather than seeing the system's A⟩ prompt, the "automatic start-up program" would be running.

Typesetting Conventions

In this article we use *THIS typeface* to show exactly what you should type at your keyboard, with the special symbols ↑ for the Control key (CTRL, CNTL or ALT on some keyboards), and ⏎ for the Return key (RET, CR or Carriage Return on some keyboards).

Since computer activities nearly always involve typing, you'll see *THIS typeface* used a lot to show commands, with letters in all upper case to distinguish commands from regular text. You may not have to type in upper case — we use it to emphasize commands. We use *lower case* for text that varies with the specific command. We also use This Typeface to show messages displayed by the system or by DDT.

Another use of DDT is to set up a user area for the first time. Since regular versions of CP/M-80 2.2 let you copy *from* a user area but not *into* a user area, the only way to put files into a new user area is to *first* put the PIP utility in the user area. You can use DDT to do this.

DDT is often used to perform a patch. When you receive an "update patch" for a system or a program, in most cases you receive a *submit file* (file with the ".SUB" file type) that performs the patching operation. You are given instructions to execute the SUBMIT utility with the submit file. If the submit file was named PATCH.SUB, you would probably type this command to make the patch:

```
A⟩SUBMIT PATCH⏎
```

The patching occurs automatically, but if you're curious, you should check the contents of PATCH.SUB. It most likely contains a DDT command line and a set of DDT commands to actually perform the patch.

Another use of DDT mentioned in this article is to recover text after a disk error. DDT has helped us recover hours of editing after the dreaded BDOS ERR: READ ONLY dropped us out of WordStar.

Setting Up a User Area

You may not need or want to set up user areas, especially if you use a floppy disk system without a large capacity hard disk. User areas are not needed, but they are useful as dividers in large capacity hard disks for separating one user's files from another, or for separating one set of files for a particular application or business from another.

Whether or not you need user areas, one of the best examples of using the DDT utility and the SAVE command is the setting up of a user area.

The idea is to store a copy of PIP.COM in a new user area. In CP/M-80 version 2.2, you cannot use PIP to copy *to* a user area; you can only move to the user area and use PIP from that user area. But how do you get PIP there in the first place?

1. With the DDT.COM and PIP.COM files on the disk in drive A, type this command:

```
A〉DDT PIP.COM↩
DDT VERS 2.1
NEXT   PC
1E00  0100
-
```

This command runs DDT and copies the *contents* of PIP.COM into a region of memory where it can be examined by DDT and eventually saved. The ".COM" file holds actual program instructions and data in a form called *object code*. You can't use a text editor to look at object code. You need a utility program such as DDT (a *program debugger*) to look at object code.

In this example we won't be changing PIP.COM in any way — just copying it into memory, then copying the memory image into a new file in a new user area.

2. Type a Control-*C* to leave the DDT utility, then type a USER command to move to a new user area such as user area 4:

```
-↑C                              (Type Control-C.)

A〉USER 4↩                       (Switch to user area 5.)
```

3. Now type the following SAVE command:

```
A〉SAVE 29 PIP.COM↩
```

This command saves 29 pages of memory into the file PIP.COM in user area 4 (the name does not conflict with PIP.COM in the other user area on the same disk).

How did we get 29? There are two methods.

Calculating SAVE Pages: The STAT Method

If you have STAT.COM on the same disk, before starting step 1 above type the following command:

```
A〉STAT PIP.COM↩

Recs      Bytes     Ext     Acc
   58        8k       1     R/W  A:PIP.COM
Bytes Remaining on A: 120k

A〉
```

The number of records (58) tells us indirectly the number of pages. *Two records make a single page.* One record is 128 bytes, and one page is two times that amount: 256 bytes. Therefore, divide the number of records by two (58 divided by 2 equals 29) to get the number of pages to use with the SAVE command.

Calculating SAVE Pages: The DDT Method

The STAT method is an estimate that in most cases will work; however, if you need the assurance that the number you pick is absolutely correct (and not higher than necessary so that you don't waste disk space), use the DDT method.

When you execute DDT and specify the filename PIP.COM with it, DDT displays this information:

```
A〉DDT PIP.COM↩
DDT VERS 2.1
NEXT   PC
1E00  0100
-
```

Under the word NEXT is the next higher address in memory after the last byte of PIP.COM. This is a hexadecimal number. In hexadecimal, the letters A through F stand for decimal values 10 through 15, and hexadecimal 10H is actually decimal 16 (the "H" stands for hexadecimal).

You can subtract one from this address to get the number 1DFFH (1E00H minus 1H equals 1DFFH). Now, ignore the first two digits of the number (lower digits) and use only the higher digits:

1D (Ignore "FF" digits.)

Now convert 1DH into a decimal number:

D x 1 = 13
1 x 16 = 16
29 Use the decimal number with the SAVE command to save the pages of memory in a file.

Automatic Program Start-up

Some computers are shipped with a system "demo disk" containing an AUTOST or STARTUP program, which automatically starts a demonstration or "help" program every time you start or reset the system.

You can use this hidden talent of CP/M to automatically start WordStar when you use your WordStar system disk, or SuperCalc when you use your SuperCalc system disk, or dBASE II, or any other program on a system disk or even on another disk.

It is easy to set up a system disk to automatically start a program every time you "boot" the system. A system reset causes CP/M to look in a special location in the system area of memory before displaying the A⟩ prompt. If you put the filename of an executable program in this location of memory, CP/M will run the program you named rather than display the A⟩ prompt.

The special location in memory is called the *command buffer*. CP/M looks for the size of your command line in the first location of the buffer; if the size is zero (meaning an empty buffer), CP/M goes ahead and displays the A⟩ prompt and waits for your typed command. CP/M stores your typed command in this buffer before running it.

With a command buffer altered to contain the name of a program, CP/M runs the program. However, with a command buffer altered this way, you can't run any other program immediately after start-up. You have to leave the automatically-run program in order to get CP/M's A⟩ prompt and run another program. In most application programs you can leave the program without any problem; but if you press the reset button or otherwise perform a system start-up, the automatic program starts running again.

Here are some reasons for setting up a system disk's command buffer to run a program automatically:

- Starting a large application program such as an accounting system, an integrated word processing/spreadsheet/filing program, a data base management system, etc. The assumption is that this program is the only one you need to run when you're using this disk.

- Creating personalized application disks that each perform separate applications. You might have separate word processing, forecasting, and data base management disks, and switch disks to change from one activity to another.

- Running a printer setup program that sends special codes to the printer to initialize it, then returns control to CP/M and the system prompt, or running a modem setup program that sets up communication automatically with a host system over a modem-to-telephone connection.

Some computers (notably the Osborne 1 and Executive models) are supplied with a version of CP/M already tailored to make use of automatic program start-up. Osbornes are supplied with the command file AUTOST.COM which is set to run a specific application program supplied with the

WOW!

P-R-O-P-O-R-T-I-O-N-A-L
Spacing on WordStar

You are reading text printed by WordStar in proportional spacing, providing a professional, easy to read, typeset appearance.

Complete details for printing in proportional spacing directly from WordStar, setting two or more fully justified columns on a page, and underlining spaces between words, are provided. The techniques will work on all versions of WordStar, and will drive Diablo, Xerox, Qume, NEC, and other daisy-wheel printers.

Now you can have the professional appearance of typeset text. Using PS is as easy as turning on bold or underline and is done right in your document, then printed by WordStar automatically! No technical knowledge needed.

PS ON WordStar–$22.50 postpaid

Please send me ________ Copies. Enclosed is my check (or Visa/MC# and exp. date) for $ ____________, made out to:
(NYS residents add 7% sales tax)

WRITING CONSULTANTS
Suite 152 / 11 Creek Bend Drive, Fairport, New York 14450
VISA/MC orders call (716) 377-0130 Dealer inquires invited

Circle number 10 on the reader service card.

At Last!

An accounting program written for business, not accountants.

If this sounds like what you've been looking for, you should try MINI-LEDGER, our single-entry program for people who want results, not complications.

- 99 user-definable payment and income codes
- Provides almost all the information needed for taxes and financial statements
- Virtually instant analysis of your cash-flow for any period from 1 to 12 months
- You don't have to be an accountant to use it

Requires: CP/M™, CP/M-86, MS-DOS, PC-DOS-2.0

Formats: Most disk formats available

Cost: $150 complete program
$ 30 manual-only with demo disk
California Customers add 6.5% sales tax

To Order: Call or Write
Paradigm Consultants
39243 Liberty Street, Suite L
Fremont, CA 94538
(415) 796-0543
Outside California Call **(800) 821-8407**

MINI-LEDGER

CP/M IS A Registered Trademark of Digital Research Corporation

Circle number 7 on the reader service card.

computer. For example, the AUTOST.COM file on the WordStar disk runs WordStar; the AUTOST.COM file on the SuperCalc disk runs SuperCalc. To change how these files work, you must consult the computer's manual (for the Osborne 1, see the *Osborne 1 User's Reference Guide*, page 247).

If your computer is supplied with such a program, use it rather than doing the following steps, because the following steps may not work properly for your already-tailored system.

Setting Up an Automatic Command Line

To set up an automatic start-up program, decide the exact command line you would type to execute the program. For example, you might want to start a major application program that offers many choices from its menu (such as WordStar, CP+ or Menu Power). You probably need a single command word like *WS* or *MENU*, followed by a Return.

On the other hand, you may want to start a program with a longer command line. For example, you may want to run an MBASIC printer setup program named SETUP.BAS. To do this you would need a command line with the words *MBASIC SETUP* followed by a Return.

Once you decide on the command line, count the number of characters it has, including any spaces (but not including the Return, nor the A> prompt). If the number is more than ten, convert the number to hexadecimal (ten is A, eleven is B, etc. to F for fifteen, 10 for sixteen, etc.). Write down this number and the command line.

To change the command buffer, you need access to the system itself. Some manufacturers provide a *source code* version of the system in a file with an ".ASM" file type. It might be easier to change the readable source code, then use the ASM utility program to assemble the source code into computer-readable *object code*, and then use the LOAD utility to package the object code into an executable program.

Then again, it might be harder to do this, and you must use your manufacturer's documentation to do it, since we cannot describe every CP/M system's source code.

You may already have an executable program version of the system in a file with the ".COM" file type. Alspa ACI computers come with the file ACIDOS.COM holding its floppy disk CP/M system. If you have such a file, you can skip the MOVCPM-SAVE or SYSGEN-SAVE process and directly use DDT on the file.

If you don't, you can choose the MOVCPM-SAVE method if you have the MOVCPM utility; if not, use the SYSGEN-SAVE method.

The MOVCPM-SAVE Method

Some CP/M systems are supplied with the MOVCPM utility that lets you create larger or smaller operating versions of CP/M. MOVCPM is mostly used to allow system growth to 64K from 48K as you add memory; with the trend toward 64K memory built-in, you have no need of MOVCPM except to do the following operation. (This is why some manufacturers do not include MOVCPM, and you have to use the SYSGEN and SAVE method.)

A special form of the MOVCPM command copies an image of the system into a region of memory where you can use SAVE to store it in a regular file:

```
A>MOVCPM * *↩
```

Typing *MOVCPM* followed by a space, an asterisk, another space, another asterisk and Return, starts the system copy operation. MOVCPM's greatest asset in this function is its ability to calculate the actual number of pages you need to specify in the SAVE command:

```
CONSTRUCTING 64K CP/M ver. X.X
READY FOR "SYSGEN" OR
"SAVE 45 CPM64.COM"
A>
```

MOVCPM tells you what SAVE command to use, with the number of pages as well as an optional filename. We suggest that you *not* use the ".COM" extension so that you do not mix it with other program files. We use MYCPM1.SYS:

```
A>SAVE 45 MYCPM1.SYS↩
```

With the system image stored in the file MYCPM1.SYS, you are ready to use DDT on it.

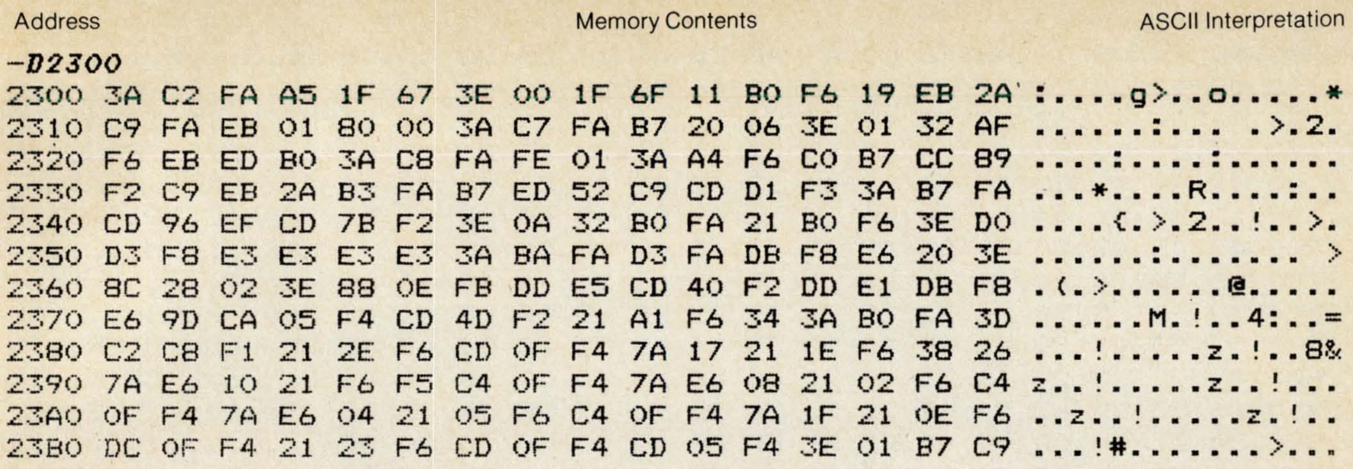
The SYSGEN-SAVE Method

Every CP/M system should be supplied with a suitable SYSGEN program (named SYSGxx, SYSTEM, SYST1K, or a similar name depending on the manufacturers' version) that lets you turn an ordinary disk into a system disk. To do this, use SYSGEN to load the system into a region of memory where you can examine it with the DDT utility.

You should use MOVCPM if you have it, because it calculates the number of pages to use with SAVE. If you don't have MOVCPM, you can use SYSGEN if you look in the system documentation for information about using it to save a system image. In that section you will find the number of pages occupied by the system image, used in a SAVE command to save the image in a file. If you don't have such information, you can estimate it yourself as described in this section.

Your version of SYSGEN might appear different than the following example, but it should work essentially the same way. You type the name of the SYSGEN program and the drive letter of a drive holding the system disk, usually drive A:

```
A>SYSGEN↩
SOURCE DRIVE NAME (OR RETURN TO SKIP) A↩
```



```
-D2300
2300 3A C2 FA A5 1F 67 3E 00 1F 6F 11 B0 F6 19 EB 2A :....g>..o.....*
2310 C9 FA EB 01 80 00 3A C7 FA B7 20 06 3E 01 32 AF ......:... .>.2.
2320 F6 EB ED B0 3A C8 FA FE 01 3A A4 F6 C0 B7 CC 89 ....:....:......
2330 F2 C9 EB 2A B3 FA B7 ED 52 C9 CD D1 F3 3A B7 FA ...*....R....:..
2340 CD 96 EF CD 7B F2 3E 0A 32 B0 FA 21 B0 F6 3E D0 ....{.>.2..!..>.
2350 D3 F8 E3 E3 E3 E3 3A BA FA D3 FA DB F8 E6 20 3E ......:....... >
2360 8C 28 02 3E 88 0E FB DD E5 CD 40 F2 DD E1 DB F8 .(.>......@.....
2370 E6 9D CA 05 F4 CD 4D F2 21 A1 F6 34 3A B0 FA 3D ......M.!..4:..=
2380 C2 C8 F1 21 2E F6 CD 0F F4 7A 17 21 1E F6 38 26 ...!.....z.!..8&
2390 7A E6 10 21 F6 F5 C4 0F F4 7A E6 08 21 02 F6 C4 z..!.....z..!...
23A0 0F F4 7A E6 04 21 05 F6 C4 0F F4 7A 1F 21 0E F6 ..z..!.....z.!..
23B0 DC 0F F4 21 23 F6 CD 0F F4 CD 05 F4 3E 01 B7 C9 ...!#.......>...
```

Figure 1. *Typical display of memory showing hexadecimal values at each location, with a column at the far right showing an ASCII character interpretation of the hexadecimal values. This column is meaningless unless the hexadecimal values actually represent ASCII characters.*

SYSGEN displays this message, letting you insert another system disk at this point if you want, before pressing Return to actually read the source disk:

```
SOURCE ON A, THEN TYPE RETURN ↵
FUNCTION COMPLETE
DESTINATION DRIVE NAME
(OR RETURN TO REBOOT)
```

At this point, type a Return or a Control-*C* to return to the CP/M prompt. Ordinarily you would choose the drive holding the disk to be be converted into a "bootable" system disk to hold the system image. However, you are preparing to use the SAVE command to save the system image in a file.

In order to use SAVE, you must first estimate the number of pages. If you have a typical 64K system, CP/M usually occupies 34 to 45 pages. Check your system documentation (our Alspa version of CP/M occupies 38 pages), or use DDT without a filename to examine memory and estimate the space occupied by the system image:

```
A)DDT↵
DDT VERS 2.2
-
```

The original CP/M-80 manual says that SYSGEN loads a memory image of CP/M to occupy 34 pages (actually in locations 900H through 227FH). 227FH, in memory pages, is 34, because 22H is, in decimal, 2 + (2 x 16).

Therefore, using DDT's *D* command, display the region of memory starting at location 2250H and ending at location 2350H:

```
-D2250,2350↵
```

You may see a display such as the one shown in figure 1 — mostly hexadecimal numbers, with strange but readable characters in the far right column. If so, keep displaying memory, using increments of 100:

```
-D2350,2450↵
```

(Display of hexadecimal numbers and corresponding ASCII characters.)

```
-D2450,2550↵
```

When you see something readable like the display in figure 2, you know you have found the sign-on message for your version of CP/M, which in many tailored versions is also a sign-on message for that brand of computer. Following this sign-on message is a lot of periods, representing the hexadecimal zeroes. (This display is explained later.)

Note the address after the sign-on message, and convert it to a decimal number of pages. For example, if the address is 2800H, subtract 1H from the number to get 27FFH, then convert 27 to decimal: (2 x 16) + 7 equals 39 pages.

With the number of pages calculated, type the following SAVE command to save the system image in a file (choose a name like MYCPM1.SYS):

```
A)SAVE 45 MYCPM1.SYS↵
```

With the system image stored in the file MYCPM1.SYS, you are ready to use DDT to "patch" it.

DDT: Patching the Command Buffer

Start the DDT utility with the name of the file holding the system image:

```
A)DDT MYCPM1.SYS↵
DDT VERS 2.2
NEXT  PC
2700  0100
-
```

The DDT utility has many commands for displaying and changing locations in memory. The *S* command lets you step

```
-D2760,2860
2760 D0 E6 0F 32 AB F6 C9 47 AF CB 08 17 CB 08 17 CB ...2...G........
2770 08 17 CB 08 17 C9 49 44 20 4E 4F 54 20 46 4F 55 ......ID NOT FOU
2780 4E C4 43 52 C3 4C 4F 53 54 20 44 41 54 C1 42 55 N.CR.LOST DAT.BU
2790 53 D9 50 52 4F 54 45 43 D4 46 41 55 4C D4 52 45 S.PROTEC.FAUL.RE
27A0 41 44 59 20 45 52 52 4F D2 42 4F 4F 54 A0 0D 0A ADY ERRO.BOOT...
27B0 52 45 41 44 A0 0D 0A 57 52 49 54 45 A0 0D 0A 53 READ...WRITE...S
27C0 45 45 4B A0 0D 0A 48 4F 4D 45 A0 0D 0A 69 6E 73 EEK...HOME...ins
27D0 65 72 74 20 3F 3A 20 64 69 73 6B 20 74 68 65 6E ert ?: disk then
27E0 20 6B 65 79 20 72 65 74 75 72 EE 0D 0A 0A 41 4C  key retur....AL
27F0 53 50 41 20 43 4F 4D 50 55 54 45 52 2C 20 49 4E SPA COMPUTER, IN
2800 43 2E 20 20 36 31 4B 20 43 50 2F 4D 20 20 31 4B C.  61K CP/M  1K
2810 20 53 65 63 74 6F 72 73 20 20 76 32 2E 39 42 0D  Sectors  v2.9B.
2820 8A 00 00 00 00 00 FF FF FF FF 15 00 00 00 00 00 ................
2830 21 C4 EE 22 C1 EE 31 7F 00 3E A6 CD 4E F7 3E 40 !.."..1..>..N.>@
2840 CD 4E F7 3A 47 EE D3 03 3A 48 EE D3 01 3A 49 EE .N.:G...:H...:I.
2850 D3 05 3E 27 CD 4E F7 3E 91 D3 D3 3E 41 CD 55 F7 ..>'.N.>...>A.U.
2860 2F CD 55 F7 AF 32 B2 FA 32 04 00 3A 3E EE 47 E6 /.U..2..2..:>.G.
```

Figure 2. *The section of memory containing the sign-on message for our version of CP/M (Alspa ACI-1 computer).*

through locations starting from one and proceeding sequentially, making changes to some locations and not others. This command is probably the easiest to use for making a simple patch.

Start by typing the *S* command with 0980H as the address:

```
-S0980⏎
0980 C3
```

The address 0980H is the start of the CP/M section called the CCP (Console Command Processor), and is the first location to receive control after CP/M sets itself up for receiving commands. Step through this address and the next six addresses by pressing Return for each one, without making any changes:

```
0980 C3  ⏎
0981 5C  ⏎
0982 CE  ⏎
0983 C3  ⏎
0984 58  ⏎
0985 CE  ⏎
0986 7F  ⏎
```

The last one, 0986H, always has the value 7FH. This value tells you that the next address is the beginning of the command buffer:

```
0987 00
```

In this location, type the number of characters in the command line to insert in the command buffer. For an example we use the command line *MODEM T*, which executes our MODEM program with the *T* option for terminal mode. This command line is seven characters long (including the space between *MODEM* and *T*), so we put a seven in this location:

```
0987 00 5⏎
```

DDT displays the next memory location, in which you put the first character of your command line:

```
0988 20 4D⏎                (4DH is the code for "M".)
```

Continue typing the command line using hexadecimal ASCII code numbers for each letter, and 20H for a space (consult the ASCII chart accompanying this article). If your command line has digits, use the ASCII codes for the digits, not hexadecimal or decimal numbers.

```
0989 20 4F⏎                          (4FH is "O".)
098A 20 44⏎                          (44H is "D".)
098B 20 45⏎                          (45H is "E".)
098C 20 4D⏎                          (4DH is "M".)
098D 20 ⏎                    (20H is a blank space.)
098E 20 54⏎                          (54H is "T".)
098F 20 00⏎                      (00H signals end.)
0990 20 .⏎                     (Stop the S command)
```

After typing the 00H at the location following the last character of your command line, type a period (.) to stop the *S* command. Now type the *D* command with this address pair to see if you spelled your command line properly:

```
-D0980,09C0⏎
```

Figure 3 shows a sample display with the command line spelled correctly. The display shows the region of memory at the start of the CCP, with the command line in the command buffer. The first column is the address of the first item in the same row. The far right column shows the ASCII characters that are possible if you interpret the hexadecimal codes as ASCII characters. Following your command line is the Digital Research Inc. copyright notice, which is stored in every

```
-D0980,09C0
0980 C3 5C DB C3 58 DB 7F 07 4D 4F 44 45 4D 20 54 00 .\..X...MODEM T.
0990 20 20 20 20 20 20 20 20 43 4F 50 59 52 49 47 48         COPYRIGH
09A0 54 20 28 43 29 20 31 39 37 39 2C 20 44 49 47 49 T (C) 1979, DIGI
09B0 54 41 4C 20 52 45 53 45 41 52 43 48 20 20 00 00 TAL RESEARCH  ..
09C0 00 .
```

Figure 3. *The region of memory you alter to include your command line. This is the start of the CCP module of CP/M. The first column is the address of the first location in that row. The far right column shows the ASCII characters interpreted by DDT as it displays the hexadecimal codes.*

legitimate copy of CP/M.

If your command line is spelled incorrectly, check your ASCII codes against the ASCII chart accompanying this article. Be sure to use hexadecimal values and not the decimal equivalents (hex numbers mark each row and column). Use the *S* command as shown in the previous example to replace locations with correct values.

If the command line is correct, return to the DDT dash (-) prompt (type a period if you are in the *S* command), then type a Control-*C* to leave DDT and return to the CP/M prompt:

```
-↑C
A>
```

You are now ready to use SYSGEN to save the altered memory image on a new disk. Place a newly-formatted disk in drive B (if you have only one drive, have the disk ready). Type the SYSGEN command:

```
A>SYSGEN↵
SOURCE DRIVE NAME (OR RETURN TO SKIP) ↵
```

SYSGEN displays this message, and you should press Return only — do not type a drive letter, because the source is not from disk but from memory itself.

```
FUNCTION COMPLETE
DESTINATION DRIVE NAME
(OR RETURN TO REBOOT)
```

Now type a *B* (or the drive to receive the system image), followed by Return. If you are using one drive, type *A* followed by Return:

```
DESTINATION DRIVE NAME
(OR RETURN TO REBOOT) B↵
DESTINATION ON B THEN TYPE RETURN
```

If you are using only one drive (A), replace the disk with the new disk to receive the system image; otherwise, if drive B holds the newly-formatted disk to receive the image, then press Return. SYSGEN stores the system image on the disk.

You now have a bootable system disk with the altered command buffer. You should copy the appropriate program (the one activated by the command line in the command buffer) and associated files to this disk.

Other Uses of DDT

DDT is a valuable tool for the programmer. It lets programmers test their programs and make instant changes to see better results. Its name is derived from the activity known as "fixing bugs."

DDT can also be very useful for any users who find themselves in catastrophic situations. For example, if your disk failed while you were editing new text using WordStar, you could use DDT to find the text in memory and calculate the number of pages to use with the SAVE command, thereby saving the text in another file.

DDT opens the entire program area of memory for easy access, letting you "peek" and "poke" to your heart's content as well as watch programs as they run. You can use it to display areas of memory, change specific locations, and load images of programs and data for SAVE operations.

You may need to practice the new skill of hexadecimal arithmetic before you become adept at using it. Addresses and values are in hexadecimal for reasons beyond the scope of this article, and you have to remember how to use them.

Saving Edited Text After a Disk Error

This is the remedy for the frustrating BDOS ERRORS that sometimes occur when you try to save text from WordStar onto a disk that has not been properly "logged in."

If any disk or system error causes your word processing program to quit in the middle of an editing session, you can still recover the editing changes and new text you typed during the session (your original file remains intact unless the disk is damaged — in which case, you need a disk editing program).

For an example, try this: use a word processing program to edit a text file and save the changes, then leave the word processing program. Use DDT to examine memory:

```
A>DDT↵
DDT VERS 2.2
-
```

Using the *D* command and a very large range, you can scroll quickly through memory. You can stop the fast scrolling by typing Control-*S*, and re-start the scrolling with another Control-*S* (or Control-*Q*). Scanning this way you can look through the entire 64K of memory in less than ten minutes. Usually the text you were editing appears in the far right column after about five minutes of scrolling.

When you first see text you can recognize, jot down an address that comes before the text. Scroll through the text area until you can recognize the end of the text you need. We scrolled through seven pages of WordStar text in about two minutes.

Find the end of the text and jot down an address that comes after it. To stop scrolling altogether, type any key, preferably the *M* key, which is the name of the next command to type.

If you typed *M* it should appear on the DDT command line following the DDT dash (-) prompt. Continue typing the command as shown below, substituting the starting address of your text for *7840*, and the ending address for *D000* (7840H through D000H contained seven pages of our WordStar text):

```
-M7840,D000,0100⮐

            —7840 is the start, and D000 is the end.
```

This *M* command moves the section of memory between 7840 and D000 (or your starting and ending addresses) to address 0100H, which is the start of the program area of memory. From this area you can retrieve the text using SAVE.

Before using SAVE, you must calculate the number of pages to save. DDT provides an easy command for performing hexadecimal additions and subtractions so that you can calculate an address if given two values such as a starting and ending address, or an address and an offset value.

To calculate the number of pages, first use the *H* command and your starting and ending addresses in this order to get the difference:

```
-HD000,7840⮐        (7840H — start, D000H — end.)
4840  57C0
```

The first number, 4840H, is the sum of D000H and 7840H (after reaching FFFFH, the system counts from 0000H). The second number is the one to use: 57C0H in the above example is the difference between 7840H and D000H, and the number of locations occupied by the text.

Now add 100H to this difference (substitute the difference you have):

```
-H57C0,0100⮐                 (57C0H plus 0100H.)
58C0  56C0
```

The first number 58C0H is the sum you need. To convert the address to a number of pages, subtract 1H (58B9H), then convert the first two digits (58) into a decimal number:

(5 x 16) + 8 = 88

Now use this number for the number of pages to SAVE:

```
A>SAVE 88 RECOVERD.TXT⮐
```

Use a word processing program to examine the contents of RECOVERD.TXT. You may have all the text you need plus some empty space or funny characters. Save only the text you need in a separate file (for example, use WordStar's block write command), then delete this file.

Patching a Program Or Merging Program Sections

Usually program patching requires specific instructions. You must know the exact address locations and the exact hexadecimal values to type into these locations.

The most common command to use for location patching is the *S* command. Using *S* you can start at a location and either change its value by typing a new hexadecimal value and pressing Return, or leave it alone by pressing Return only. Either way you move on to the next location. You can change many consecutive locations quickly, then stop by typing a period (.).

Another popular use of DDT is to bring one program into memory, then bring another module or revised section of the program into memory merging it with the first program, to form a new program image you can then SAVE to a disk file.

For example, Modem7 is a well-known public domain program that requires you to select a module specific to your system to merge with the program before the program will work on your system. You use DDT to bring MODEM7 into memory, then you merge a module such as KAY.HEX with the image of MODEM7, and finally use Control-*C* to leave DDT and SAVE the result in a new file:

```
A>DDT MODEM7⮐
DDT VERS 2.2
NEXT  PC
3800  0100
-IKAY.HEX⮐                (Insert KAY.HEX filename.)
-R⮐                          (Read file into memory.)
NEXT  PC
3800  0100
-
```

Before leaving DDT, note down the NEXT address for calculating the number of pages for the SAVE command:

```
-↑C       (Control-C)
A>SAVE 55 MODEMNEW.COM⮐
```

Program patching without specific instructions requires some knowledge of assembly language programming. We recommend you use specific instructions when patching, and patch only a copy of the original program, never the actual original. Experiment for a while with the altered copy before using it in normal operations. Always keep several copies of the original un-altered program safe from destruction.

DDT Summary

You can use DDT to examine and change an executable program (".COM" file) or a program in hexadecimal format (".HEX" file):

```
A⟩DDT SAMPLE.HEX↵
A⟩DDT SAMPLE.COM↵
```

You can also use DDT to examine and change memory without specifying a file:

```
A⟩DDT↵
```

After starting DDT you can use these DDT commands to examine or change memory locations. All numbers are in hexadecimal. Words in *italic* are optional words, and words in this typeface are words you must supply, with UPPER case letters used for command names.

A*s*	Enter assembly language mnemonics starting at address *s*. You can insert or change code in assembly language using this command.
D*s,f*	Display memory starting at the current address or address *s*; continue the display for 16 lines or to address *f*.
Fs,f,c	"Fill" memory with hexadecimal byte c from address s to address f. Use this command to fill entire regions of memory with the same byte value.
Gs,*b,c*	Start execution at address s, with optional breakpoints at addresses *b* and *c*. The program in memory runs until it reaches a breakpoint. At a breakpoint you can use another G command.
G,*b,c*	Start execution at the current address, with optional breakpoints at addresses *b* and *c*.
G0	Properly terminate DDT session, readying program for a SAVE. You can also use a Control-C from the DDT prompt to terminate DDT.
Ifilename	Insert filename into the file control block (005CH) for an R command. Use this command first, then R, to merge a file's contents in memory with what is already in memory.
L*s,f*	List "disassembled" code (code interpreted by DDT into assembly language mnemonics) from the current address or address *s*, and continue for 12 lines or to address *f*.
Ms,f,d	Move a block of memory starting at s and ending at f to destination d.
R*b*	Read the file inserted by an I command into the program area, with optional bias *b*. Use this command after I to merge a file's contents with what is already in memory.
S*s*	Examine or alter memory starting at address *s*. For each address and value, type another value to replace the old value, or press Return to keep it, or type a period (.) to stop the S command.
T*n*	Trace execution and display all registers and flags for one or *n* execution steps.
U	Untrace (same as the T command, without display of registers).
X*r*	Examine all CPU registers or examine or alter register *r*, where *r* is one of the following CPU registers: C (carry flag), Z (zero flag), M (minus flag), E (even parity flag), I (interdigit carry), A (accumulator), B (BC register pair), D (DE register pair), H (HL register pair), S (stack pointer), or P (program counter).

DDT commands are designed for debugging programs. To debug programs you must have a basic understanding of hexadecimal arithmetic, addresses in memory, the locations of CP/M modules in your memory, and assembly language programming. There are numerous books on these subjects, as well as articles in more technical magazines.

FILEBASE™

The most flexible data base manager
for personal computers.
For PC-DOS, MS-DOS and CP/M (release 3.0)
$100

FILEBASE lets you create, append to and sort files; re-arrange, remove or add fields; process variable-length field records and perform random updating. Create new files or use exisitng data files created by dBASE II, WordStar, MailMerge, DataStar, BASIC and other programs.

"...menu and prompt driven"
Lifelines, Jun 83

"wins many points for being compatible with MailMerge™..."
User's Guide, Feb/Mar, 84

"..everything you could ask for in documentation, function and price."
Dr. Dobb's Journal, Feb 84

"...sorts on last name even if embedded in full name field."
"...sorts on zip code even if part of a "city, state zip" field."
Microsystems, Aug 83

UTL: The Universal Utility $40

Six Enhanced CP/M™ Commands - Files Sizes with Attributes
TYPE Command with Bi-Directional Scan and Single Line Advance
DIR Command with Sorted Columnar Display and Bi-Directional Scan

"...extension and features not generally available ..."
Microsystems Vo. 5/Number 1, Jan 1984

SPECIAL: FILEBASE and UTL for $125.

EWDP Software, Inc. • P.O. Box 40283 • Indianapolis, IN 46240
AMEX, VISA, MASTERCARD, or C.O.D. • (317) 872-8799

Trademarks: CP/M — Digital Research; FILEBASE, UTL — EWDP Software; WordStar/MailMerge/DataStar — MicroPro; dBASE II — Ashton-Tate.

Circle number 4 on the reader service card.

CP/M-80 •
CP/M-86 •
PC-DOS •
MS-DOS •

dBASE II Tutorial
Part 2: Indexing & Sorting

Indexing and sorting records in the People data base, with a command file for auto searching and appending.

by Robert Cowart

In issue #5 of *User's Guide*, we covered the basics of creating a dBASE II database file, editing records in it, and locating information in it using keyboard entry of commands. The commands covered last time were:

create	— Create a database file.
display structure	— Display structure of a database.
display status	— Display status of a database.
append	— Append records from another database file.
use	— Select a database file for use.
goto	— Go directly to a position in the file.
skip	— Skip to the next record in the file.
list	— Display many records in the file.
display	— Display one record in the file.
set print on	— Activate printer.
edit	— Edit records in a file.
edit nnnnn	— Edit one record in a file.
locate for	— Locate a record in a file.

We also covered the concept of the dBASE II record pointer, and how to deal with the *** SYNTAX ERROR *** message.

If you followed the examples in part one, you should now have an "electronic phone book" with names, addresses, phone numbers and so forth. For anyone who is just now joining us, you will have to catch up by creating a new database file with the structure shown below:

```
. use PEOPLE ↵
. display structure ↵

STRUCTURE FOR FILE:          A:PEOPLE .DBF
NUMBER OF RECORDS:           00000
DATE OF LAST UPDATE:         00/00/00
```

Typesetting Conventions

Throughout this article we use *THIS typeface* to show exactly what you should type at your keyboard, with the special symbols ↑ for the Control key (CTRL, CNTL or ALT on some keyboards), and ↵ for the Return key (RET, CR or Carriage Return on some keyboards).

To clearly differentiate between dBASE II commands that you type and the names of files and other data you type, we use *this typeface lower case* words for dBASE II commands, *THIS TYPEFACE UPPER CASE* for data and filenames you type in examples, and THIS TYPEFACE for dBASE II messages. We also use nnnnn in place of a record number that can vary with every database file.

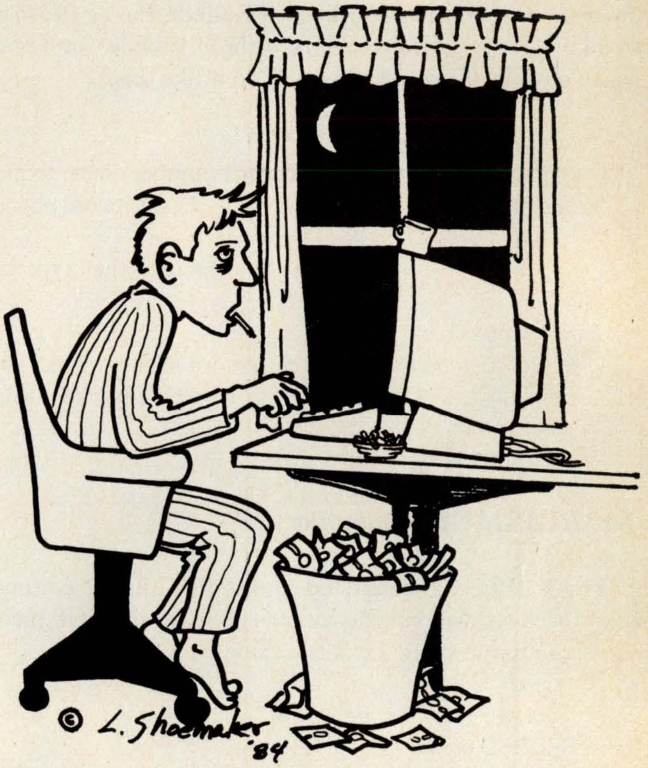
```
PRIMARY USE DATABASE
FLD          NAME       TYPE      WIDTH      DEC
001       FIRST:NAME       C        010
002       LAST:NAME        C        015
003        COMPANY         C        020
004         STREET         C        020
005          CITY          C        012
006          STATE         C        002
007           ZIP          C        005
008        H:PHONE         C        012
009        W:PHONE         C        012
010         NOTES          C        050
** TOTAL **             00159
```

To be sure you have records to work with in the examples, use the APPEND command to enter people into your database file. While doing this, add the following fictitious names somewhere in the middle of your batch of people. We use these names later on in the tutorial and eventually eliminate them.

NOTE:
If you saved the examples from Part One (*User's Guide* issue #5), these names are probably already entered. Check to make sure by using the LIST command.

```
RECORD# nnnnn

FIRST:NAME    :WOLFGANG↵
LAST:NAME     :MOZART↵
COMPANY       :CHURCH OF AUSTRIA↵
STREET        :135 G. CLEF COURT↵
CITY          :SALZBURG↵
STATE         :CA↵
ZIP           :13579↵
H:PHONE       :800-555-1212↵
W:PHONE       :213-123-4567↵
NOTES         :↵


FIRST:NAME    :PAUL ↵
LAST:NAME     :HINDEMITH ↵
COMPANY       :WORLD HARMONY, INC. ↵
STREET        :2 RONDO RD.SUITE 122↵
CITY          :ACAPPELLA ↵
STATE         :VT ↵
ZIP           :02468 ↵
H:PHONE       :802-555-1212 ↵
W:PHONE       :802-024-6810 ↵
NOTES         :↵
```

```
FIRST:NAME    :JACOPO ↵
LAST:NAME     :PERI ↵
COMPANY       :EARLY OPERA LTD. ↵
STREET        :1597 DAPHNE DRIVE ↵
CITY          :FLORENCE ↵
STATE         :IA ↵
ZIP           :98765 ↵
H:PHONE       :512-555-1212 ↵
W:PHONE       :512-987-6543 ↵
NOTES         :↵
```



HACKER'S BLOCK

You may remember from last time that we wanted to be able to change Mozart's address when he moved. This was done with the following set of commands:

```
. locate for last:name= "MOZART"↵
RECORD nnnnn
. edit nnnnn↵
```

Mozart's record appears in an EDIT screen, letting us change any field by typing over the old data and using Control-key editing commands:

↑X	Move the cursor one field ahead (one line down).
↑E	Move the cursor one field back (one line up).
↑D	Move the cursor one space ahead within a field (on a line).

↑*S*	Move the cursor one space back within a field (on a line).
↑*U*	Mark the entire record for deletion, or un-mark the record if it is already marked.
↑*Y*	Erase the field's contents (erase the data on one line).

To stop editing a record, use either Control-*W* to save the changes, or Control-*Q* to *abandon* the changes and leave the record as before.

This method is fine for editing a single record, but let's assume you want to change a series of records all in the same way. For example, say you inadvertently entered the wrong zip code for everyone who lives in Radnor, Pa. as 19086 instead of 19087. Editing each record individually would be a waste of time, although you could do it like this:

```
. locate for city= "RADNOR"↩
RECORD nnnnn              (Record number nnnnn found.)
. edit nnnnn↩                        (Edit record nnnnn.)

                         (Make your changes, then type ↑W)

. continue↩
RECORD nnnnn            (Next record nnnnn found.) . edit
nnnnn↩                               (Edit record nnnnn.)
```

The REPLACE command

The REPLACE command makes this kind of editing a snap, because you can do either single or multiple record editing automatically. Let's try a single record first:

```
. locate for last:name= "PERI"↩
RECORD nnnnn
. display zip↩
nnnnn    98765
. replace zip with "11111"↩
00001 REPLACEMENT(S)
. display zip↩
nnnnn    11111
. replace zip with "98765"↩
00001 REPLACEMENTS(S)
```

You can try the above example to replace the zip code for Jacopo Peri. To do the multiple replacement as in the RADNOR zip code example (which is probably not in your database file), you would use this command:

```
. replace zip with "19087" for city= "RADNOR"↩
nnnnn REPLACEMENT(S)
```

If you make a mistake, or want to reverse what you just did, just use the same command again, with the correct zip code specified.

The REPLACE command can be used in dBASE II programs (covered later) to replace one field with another, to combine several fields into one field, or to modify particular fields all under program control.

REPLACE is useful for repeating the same editing change. EDIT, on the other hand, lets you change anything, but it requires you to type each change.

For example, say you wanted to create a new field (full:name) in your database file, which has the combined first name and last name for each person. You would create a new database file that has the same structure as the existing PEOPLE database file, but with this one added field. You would then use APPEND to append the data from PEOPLE into the new file.

Now you have a new file with the added field, but the field is still empty. Using REPLACE, you could quickly have dBASE II run through your file and fill the new field. The following REPLACE command would do the trick (don't try this on PEOPLE):

```
. replace full:name with first:name + last:name↩
```

This command would concatenate (+) the data from the first:name and last:name fields to form the information for the full:name field.

Just BROWSING, Thanks...

Another powerful way to edit your database file is with the BROWSE command. The effect of this command is almost like printing your database file out on paper and looking it over, except for two differences:

- You can see only a section of the file at a time.
- You can make changes to fields if you want to.

BROWSE is a very powerful command. Sometimes the screen scrolling is a little slow, and you might feel a bit "lost" once in a while (especially if you change a "key" field in an indexed database file, covered later).

BROWSE is not the kind of command we can display here on paper, so just try it yourself. The trick to getting around in BROWSE is to use the Control-key commands:

↑*A*	Move left one field.
↑*F*	Move right one field.
↑*S*	Move left one letter.
↑*D*	Move right one letter.
↑*R*	Save changes and move back one record.
↑*C*	Save changes and move on to the next record.
↑*B*	Pan the window right.
↑*Z*	Pan the window left.
↑*W*	Save changes and exit.
↑*Q*	Exit without saving changes (current record only).

You will see up to 19 records per screenful, one per line, and as many fields as will fit. Once you get to a spot you want to edit, just use the normal EDIT and DELETE (↑*U*) control codes to make changes.

BROWSE has a few idiosyncrasies you should know about. A field will not appear on the screen unless all of it can fit there. You may have to pan left or right several times to display some larger fields. Also, the ↑*Q* and ↑*W* commands only apply to the *current* record. Once you type ↑*C* or ↑*R*, the record you were on is saved as you left it. If you change a record accidentally, you have two choices: either correct it and move on, or, without having left that record, type ↑*Q* abandon the change, then re-enter using *BROWSE*↵ again.

The DELETE Command

As with biological brains, it's good practice to clear out the cobwebs occasionally, or else bad information can accumulate, leading to false conclusions. Computers can falsely conclude things more easily than (most) people can, so it's even more important to keep your computer's brains up-to-date. You use the DELETE command to clean house.

What records do you delete? Ones that are duplicates of other records, or outdated, or just plain bogus records. You should purge them at some time to eliminate later confusion, like sending your customers duplicate invoices, or calling someone at the wrong phone number.

You may remember from the EDIT command section of the last tutorial, that pressing ↑*U* while editing a record causes the word DELETED to appear at the top of your screen. If you press ↑*U* again, the word disappears. The ↑*U* is one way to delete records.

It's important to understand that the DELETE command merely marks the record for later deletion, and doesn't eliminate it immediately. What really happens is that dBASE II simply adds an asterisk (*) just after the number of the record you want to delete. Records with the asterisk are not actually destroyed until you issue the PACK command, discussed later on.

As with most dBASE II commands, there are several ways to use them. Remember that EDIT could use record numbers as well as the current pointer position? DELETE works the same way. Here are a number of commands, all of which are valid:

```
. goto record 10↵
00010
. delete ↵
00001 DELETION(S)
. delete next 10↵
00010 DELETION(S)
. delete for last:name= "PERI" ↵
00001 DELETION(S)
```

Now, if you were to try to edit Jacopo Peri's record, or display it, you could tell it has been marked for deletion:

```
. display first:name for last:name= "PERI" ↵
nnnnn * JACOPO
```

The asterisk (*) is the deletion mark. To see all the records which are marked for deletion, type:

```
. display for * ↵
```

To un-delete all the records you marked, type:

```
. recall all↵
nnnnn RECALL(S)
```

The PACK Command

PACK eliminates all records marked for deletion. You cannot recover erased records after using PACK.

Let's say you marked a series of records for deletion, which you wanted to eliminate from the database file altogether, so that they never appear again in a DISPLAY and LIST command.

First, make sure that the only records marked are ones to be eliminated (use the *display for* * ↵ command). Then, all you have to do is type:

```
. pack↵
nnnnn RECORD(S) COPIED
```

DBASE eliminates the unwanted records, and moves all the other records up to fill in the gaps. Note, however, that dBASE II doesn't actually free up the disk space formerly occupied by these records. To free up disk space, you have to copy the file to another file using the dBASE II COPY command (or using PIP from CP/M or COPY from PC-DOS/MS-DOS).

NOTE:

The PACK command eliminates any record previously marked for deletion by the DELETE command or by Control-*U* while using the EDIT or BROWSE commands.

The SORT Command

You will want to print data from your database file in some order (such as alphabetical order) or BROWSE through data in some order. dBASE II handles "sorting" in two ways:

1. You can create an *index file* for your database file that is sorted on a particular field or combination of fields (such as zip code, or a combination of last name and first name). You can create as many index files as you want, each sorted on different fields.

2. You can sort the entire database file using one particular field as a "key." This process takes more time than indexing a file, but the result is a completely sorted file.

If you have a database file that does not change often, you may want to use the SORT command to sort it (method 2). Using SORT you can rearrange all the records based on one particular field. For example, you could arrange them in alphabetical order according to last name, or in numerical order according to zip code. When a file is sorted in such a way, you can BROWSE in order, or print out records in order.

When you sort a database file, dBASE II copies all your information into a new database file in a new order. You can SORT your database file on any field, either in ascending or descending order, based on number fields or character fields. DBASE assumes you want to sort in ascending order if you don't specify. Your original file is not altered in any way.

The syntax for the SORT command is:

```
. sort on field to filename [ascending] ↵
                            [descending]
```

Here's an example. To create a new file called LAST which will have all your information sorted in alphabetical order according to last name, first make sure you have enough room on your disk for a complete copy of your PEOPLE database file. Then type:

```
. sort on last:name to LAST↵
```

(It may take some time before you see the following:)

```
SORT COMPLETE
```

To see what happened, open the new file and LIST the last names:

```
. use LAST↵
. list last:name, first:name↵
```

What if you want Frank Smith to appear before John Smith? This can be done too. This is called a multi-key sort and can be achieved by sorting on the least significant key first, and progressing to the most significant one.

For example, if you want a first name and last name sort with last name taking precedence, type these commands:

```
. sort on first:name to TEMP1↵
SORT COMPLETE
. use TEMP1↵
. sort on last:name to TEMP2↵
```

Now TEMP2 (or whatever name you used) is sorted correctly.

If you have more than a few records in your database file, this process will take some time. Large database files may take many hours to sort!

If you have a need to do sorting of large files on a regular basis, look into purchasing one of the add-on programs that can speed up the dBASE II sort routine. In any case you will want to sort the database file only when you need to, and perhaps print the database file and store it for future use.

If you regularly update a database file and you still need it to stay in order, then you should use the INDEX command, covered next.

Indexing and Fast Access

You may have noticed, depending on how many records you have in your database file, that the LOCATE command can be a little slow. This is true whether or not you are using a SORTed database file or not.

Why? Because regardless of the order in which your records are stored, dBASE II has to check each one until it sees the one you want. If you are looking for "ZEBRA" in a list of animals which is sorted by name, the LOCATE command starts at "AARDVARK", compares it to "ZEBRA", rejects it and moves on to the next record. So, for quick random access except by humans (who can scan down a printed row and know their alphabet), sorting doesn't really help you much.

This is where indexing can help a great deal. Indexing is a bit like sorting except that it doesn't create a new file which is a complete copy of your old one. Instead, the INDEX command creates an *index file* that acts like a pointer to records in your database file. Using the pointers, dBASE II can quickly find a particular record in your database file.

Whenever you APPEND to a database file with an active index file, the index is automatically updated. In addition, you can have as many as seven indexes open simultaneously, all of which will be kept up to date when you APPEND.

To see how indexing works, make sure you are back in the PEOPLE database file:

```
. use PEOPLE↵
```

Now type this command to index the file by last name:

```
. index on last:name to LAST↵
nnnnn RECORD(S) INDEXED
```

You have just created a last name index which dBASE II named LAST.NDX. The index file is also active at this time.

You can leave dBASE II (using the QUIT command) and return at a later time and still use this index. To use both an index file *and* your database file at the same time, you type a special form of the USE command:

```
. use PEOPLE index LAST↵ .
```

To find out how fast you can access PEOPLE, try this:

```
. find "MOZART"↵
. display↵
```

If Mozart is still in your database file, he should be found very quickly. Once found, you can EDIT, DELETE, REPLACE, or DISPLAY as usual. In fact, to the casual observer, there is no difference between using indexed and non-indexed database files except for the ability to use the FIND command. Trying to find someone in an un-indexed database file or when the index is not open will result in an error message:

```
DATABASE IN USE IS NOT INDEXED
    ?
find MOZART
CORRECT AND RETRY (Y/N)?
```

(To leave this situation, type *N* to return to the period prompt, or press your ESCape key.)

To create other indexes, use the INDEX on command as above. To make more than one active at the same time, separate index file names by commas as in this example:

```
.use PEOPLE index FIRST,LAST,COMPANY↵
```

Indexing Tips

Here are some tips on creating indexes:

- Each index must be created separately and in advance of using the FIND command.
- The FIND command uses only the first index listed in the USE command. This is called the Master Index. However, all active indexes will be updated after the use of APPEND, EDIT, BROWSE, and REPLACE.
- To change the index used for finding, use the SET command (e.g. set index to first,last,company to FIND first names).
- In general the more indexes you have open and active, the slower the system performs, especially when using the APPEND command.
- Do not change the field on which the Master Index was made. If you must change it, use the SET command to re-assign the Master Index and then EDIT.
- Packing a file while indexes are open will cause an automatic re-indexing of all open indexes.
- Typing *set index to*↵ de-activates (closes) all indexes.

Switching to Automatic Pilot

Now that you know a little about indexing, we can get into a little programming. As you probably already know, what separates dBASE II from a lot of other data base management systems is its ability to run predefined "command files" which are actually programs.

dBASE II programs use the same commands you have already experimented with. However, programs are more complicated because the commands must flow in the proper sequence.

Programs are often preferable for data base manipulation because they speed up many operations. They also allow you to create easy-to-read screens for data entry and retrieval.

When it comes to tasks like printing mailing labels or payroll checks, some programming is necessary. Without command files you would almost be better off typing every thing by hand.

I have developed a program which uses my PEOPLE database file, eliminating the hassle of typing in all those FIND commands. It gives you the choice of finding people by last name, first name or company name. Different index files are opened, depending on your choice. If the record you want is found, then dBASE II displays it in the EDIT mode. At that point you can use the normal EDIT commands to move forward or backwards through your records or change information in the records. (Remember not to change the field upon which the FIND was conducted.)

To get out of the program after seeing the information, type ↑*Q* or ↑*W* as usual. This returns you to the menu. Due to what I think is a bug in dBASE II, ↑*Q* will *not* abandon the changes you make to a record when editing under program control. So, only make changes you mean to save.

The program accompanies this article. Simply type it into a text file using a word processing program such as WordStar (in its "non-document mode" for program writing). Some word processing programs add a special "control bit" to some characters, which cause dBASE II programs to fail. If you think you accidentally edited your file in document mode, or it seems to die on a line in the program which looks correct, use PIP utility (CP/M only) to strip out any control bits that may be in the file. Here's the PIP command:

```
A)PIP PEOPLE.CMD=PEOPLE.CMD [Z] ↵
```

Call the program PEOPLE.CMD, and when you want to run it, make sure you have the following things on your disk:

```
PEOPLE.DBF
LAST.NDX
FIRST.NDX
COMPANY.NDX
```

Remember to make the index files in advance using the INDEX command, or else dBASE II will report that it can't find the index.

All lines beginning with an asterisk (*) are comments, not actual commands. They are not necessary and may be deleted. However, they will help you to figure out what is going on in the program.

On several lines, there are quotation marks separated by large gaps. This is intentional. Don't forget the quote marks hanging out on the right margin. There should be 39 regular spaces filling the gaps between the quote marks.

It is not necessary to indent lines, but the indentations help you understand the levels of IF and DO statements. You should type the dBASE program statements exactly as listed for proper results.

```
* Title:  PEOPLE.CMD  Uses people.dbf and 3 indexes.
*
*    Note: comment lines start with an asterisk (like this line).
*
*    The program first sets talk mode off and opens
*       the data base (PEOPLE.DBF), then it sets up the
*       choice for the electronic phone book menu.
*
*
SET TALK OFF
USE PEOPLE
DO WHILE T
 ERASE
 STORE ' 'TO pchoice
*
*    Now the program draws the electronic phone book menu screen:
*
*
 @ 5,10 SAY  "::::::::  ELECTRONIC PHONE BOOK MENU  :::::::::::::"
 @ 6,10 SAY  ":                                                :"
 @ 7,10 SAY  ":                                                :"
 @ 8,10 SAY  ":         A = Add More People to the List         :"
 @ 9,10 SAY  ":         F = First Name Search                   :"
 @ 10,10 SAY ":         L = Last Name Search                    :"
 @ 11,10 SAY ":         C = Company Search                      :"
 @ 12,10 SAY ":         X = Exit to Main Menu                   :"
 @ 13,10 SAY ":                                                :"
 @ 14,10 SAY ":                                                :"
 @ 15,10 SAY ":                                                :"
 @ 16,10 SAY ":::::::::::::::::::::::::::::::::::::::::::::::::::"
 @ 12,54 GET pchoice PICTURE "!"
 READ
*
*
*    The program reads the choice you select.  If you select "A",
*       the program sets up the data base and index for
*       appending new data:
*
*
 IF pchoice = "A"
        SET INDEX TO last,first,comp
        APPEND
        ERASE
        LOOP
 ENDIF
*
*    If the choice is "L", the program uses the "last name
*       search" routine.
*
*       (continued on next page)
*
```

```
*  --- last name search routine -----------------------------
*
 IF pchoice = "L"
     STORE T TO LAST
     DO WHILE LAST
        SET INDEX TO last
        STORE "          " TO mmlast
*
*              Ask for the last name (or "X" to leave the program):
*
        @ 14,21 SAY "Last name (X to Exit)? "GET mmlast PICTURE "!!!!!!!!!!"
        READ
*
*              If you choose "X" to leave the program:
*
        IF mmlast = "X"
               store F to last
               STORE " " TO pchoice
               @ 14,21 SAY "                                       "
*
*              Use 39 spaces in between the above quotes.
*
               LOOP
        ENDIF
*
*              Otherwise, search for the last name:
*
        STORE TRIM(mmlast) TO mlast
        GOTO TOP
        FIND &mlast
        IF # = 0
*
*              If the record number is zero:
*
               @ 14,21 SAY "Couldn't find it. Try again.       "
*
*              This is a delay routine:
*
               STORE 1 TO X
               DO WHILE X < 20
                    STORE X + 1 TO X
               ENDDO
               @ 14,21 SAY "                                       "
*
*              Use 39 spaces between the above quotes, as before.
*
               LOOP
        ENDIF
     EDIT #
     STORE F TO LAST
     ENDDO last
 LOOP
 ENDIF
*
* continued on next page
* --- first name search routine --------------------------------
*
 IF pchoice = "F"
     STORE T TO FIRST
     DO WHILE FIRST
        SET INDEX TO first
        STORE "          " TO mmFIRST
*
*              Ask for the first name (or "X" to leave the program):
*
        @ 14,21 SAY "FIRST name (X to Exit)? "GET mmFIRST PICTURE "!!!!!!!!!!
        READ
*
*              If you choose "X" to leave the program:
*
        IF mmFIRST = "X"
               store F to FIRST
               STORE " " TO pchoice
               @ 14,21 SAY "                                       "
*
*              Use 39 spaces in between the above quotes.
*
               LOOP
        ENDIF
*
*              Otherwise, search for the last name:
*
        STORE TRIM(mmFIRST) TO mFIRST
        GOTO TOP
        FIND &mFIRST
        IF # = 0
*
*              If the record number is zero:
*
               @ 14,21 say "Couldn't find it. Try again.       "
*
*              This is a delay routine:
*
               STORE 1 TO X
               DO WHILE X < 20
                    STORE X + 1 TO X
               ENDDO
               @ 14,21 SAY "                                       "
*
*              Use 39 spaces between the above quotes, as before.
*
               LOOP
        ENDIF
        EDIT #
        STORE F TO FIRST
     ENDDO FIRST
     LOOP
 ENDIF
*
* continued on next page
```

```
*
* --------------------company search routine ----------
*
 IF pchoice = "C"
        STORE T TO comp
        DO WHILE comp
        SET INDEX TO comp
        STORE "           " TO mmcomp
        @ 14,21 SAY "Company name (X to Exit)? "GET mmcomp PICTURE "!!!!!!!!!
        READ
                IF mmcomp = "X"
                        store F to comp
                        STORE " " TO pchoice
                        @ 14,21 SAY "                                       "
* note: use 39 spaces, as before, between the above quotes.
                        LOOP
                ENDIF
                STORE TRIM(mmcomp) TO mcomp
                GOTO TOP
                FIND &mcomp
                IF # = 0
                @ 14,21 say "Couldn't find it. Try again.       "
* Delay routine:
                        STORE 1 TO X
                        DO WHILE X < 20
                        STORE X + 1 TO X
                        ENDDO
* note: use 39 spaces, as before, between the quotes below:
                        @ 14,21 SAY "                                       "
                        LOOP
                ENDIF
        EDIT #
        STORE F TO comp
        ENDDO comp
        LOOP
 ENDIF
*
* --- exit routine ----------------------------------------
*
 IF pchoice = "X"
        USE
        RETURN
 ENDIF
*
* --- if choice is none of the above --------------------
*
 LOOP
*
* --- end of program ------------------------------------
*
ENDDO
```

continued from page 5

number of IBM PC owners who are also subscribers to this magazine because they can use the tutorials on WordStar, SuperCalc, dBASE II and other common programs.

Unfortunately we have caused a stir by making a fact known in our subtitle — that our magazine is useful to IBM PC owners. We are not hiding the fact that we are seeking advertisers. We are not oblivious to the fact that most advertising is for MS-DOS products. See our description (in this issue) of the two most recent computer shows for this analysis.

We continue our editorial policy of covering the overlap between CP/M and MS-DOS systems. We apologize to our subscribers for putting "IBM" in our subtitle and have now changed the subtitle to reflect our actual policy of covering the standard MS-DOS system. Our policy is to support standards. The first was CP/M, and now MS-DOS is the standard for sixteen-bit computers.

We agree that IBM seems to be the main topic of other magazines. This magazine treats the IBM PC as just another MS-DOS computer which can also run Concurrent CP/M-86. It so happens that a lot of IBM PC users need this magazine for its tutorials, reference guides, opinions and other articles. Please do not confuse us with your typical "PC-only" magazine.

Too bad you are selling out to IBM. There are a hundred IBM magazines. This is the last issue I'll buy. I won't like going through all the IBM articles to find a CP/M one. Might as well buy *PC World...*

Too bad — you had a good magazine. Guess I'll buy *CP/M Review.*

Anonymous
TeleVideo 803 user

Good luck — CP/M Review *has stopped publication. We have decided to take on* CP/M Review*'s subscribers as our own and fulfill their subscriptions. We are not abandoning CP/M — we are adding MS-DOS to our coverage because our readers want to know how to expand their systems and communicate with MS-DOS systems.* User's Guide *is not an IBM magazine.*

I recently sent in a subscription order. I've enjoyed the early issues which were borrowed from a friend. Keep up the good work. Your magazine is part of my support system! Thanks.

Paul Zibton
Seattle, WA

Yesterday I received issues 2, 3, and 6 of your magazine, and I am very impressed. First, I'm impressed with the obvious usefulness of the editorial content of each of the issues. Second, I'm impressed with what must have been a very wise decision on my part in the distant past to order the issues. I honestly don't remember doing so. I've enclosed a copy of my label so that perhaps you can decode my status...

In any case I've enclosed two checks under the assumption that I have not yet paid... You may consider (the balance if I already paid) as an expression of "good luck" in your new venture... If I am already a subscriber, please extend my subscription...

Thanks for the fine magazine. I wish you all the success you deserve.

Ken Sobel
Waltham, MA

You have the most useful computer magazine I have ever read. It is a great help to all us hackers. Keep printing those tutorials, articles and letters from readers.

Michael L. Abt
Fullerton, CA

I have dropped or cancelled my sub-

continued on page 75

Advertiser Index

Advertise in *User's Guide*

Jay Eisenberg - Advertising Director
JE Publishers' Representative Company
6855 Santa Monica Blvd.
Los Angeles, CA 90038
(213) 467-2266
Boston - (617) 437-7628 Chicago - (312) 445-2489
Dallas - (214) 660-2253 Denver - (303) 595-4331
New York - (212) 724-7767 San Francisco - (415) 864-3252

Send all camera-ready materials to:
User's Guide Production
2055 Woodside Road, Suite 180
Redwood City, CA 94061

Service		**Page**
1.	CompuPro	C4
2.	Computer Thaumaturgy	33
3.	DataPort	1
4.	EWDP	43
5.	Hawkeye Grafix	73
6.	Oasis Systems	C2
7.	Paradigm Consultants	37
8.	SBT	5
9.	Wizard of OsZ	74
10.	Writing Consultants	37

CP/M-80 •
PC-DOS •
MS-DOS •

Comparing Accounting Packages

Part 1: Accounting Plus vs. SBT

This first installment of a special series on accounting applications compares the receivables and inventory modules of these packages.

by Tony Bove & Cheryl Rhodes

If the first accounting package we tried had been useful enough to recommend, we would have written a tutorial on using it, rather than a comparison of accounting packages. The fact is, the first one we tried eventually did not work out, and we are now evaluating several packages to do the job. People have a variety of accounting needs, and we feel it is good to describe in detail how each accounting package does a particular task, so that you can relate the package's performance to your accounting needs.

This article compares the first package, Accounting Plus (by Software Dimensions, Citrus Heights, CA, version 3.02) with one we're now using, SBT dInvoice II and dStatements II (SBT Corp., Sunnyvale, CA, version 3.9).

Our plan was to use an accounting package like Accounting Plus to run our magazine business, and then write a tutorial on how to use the package to run almost any business.

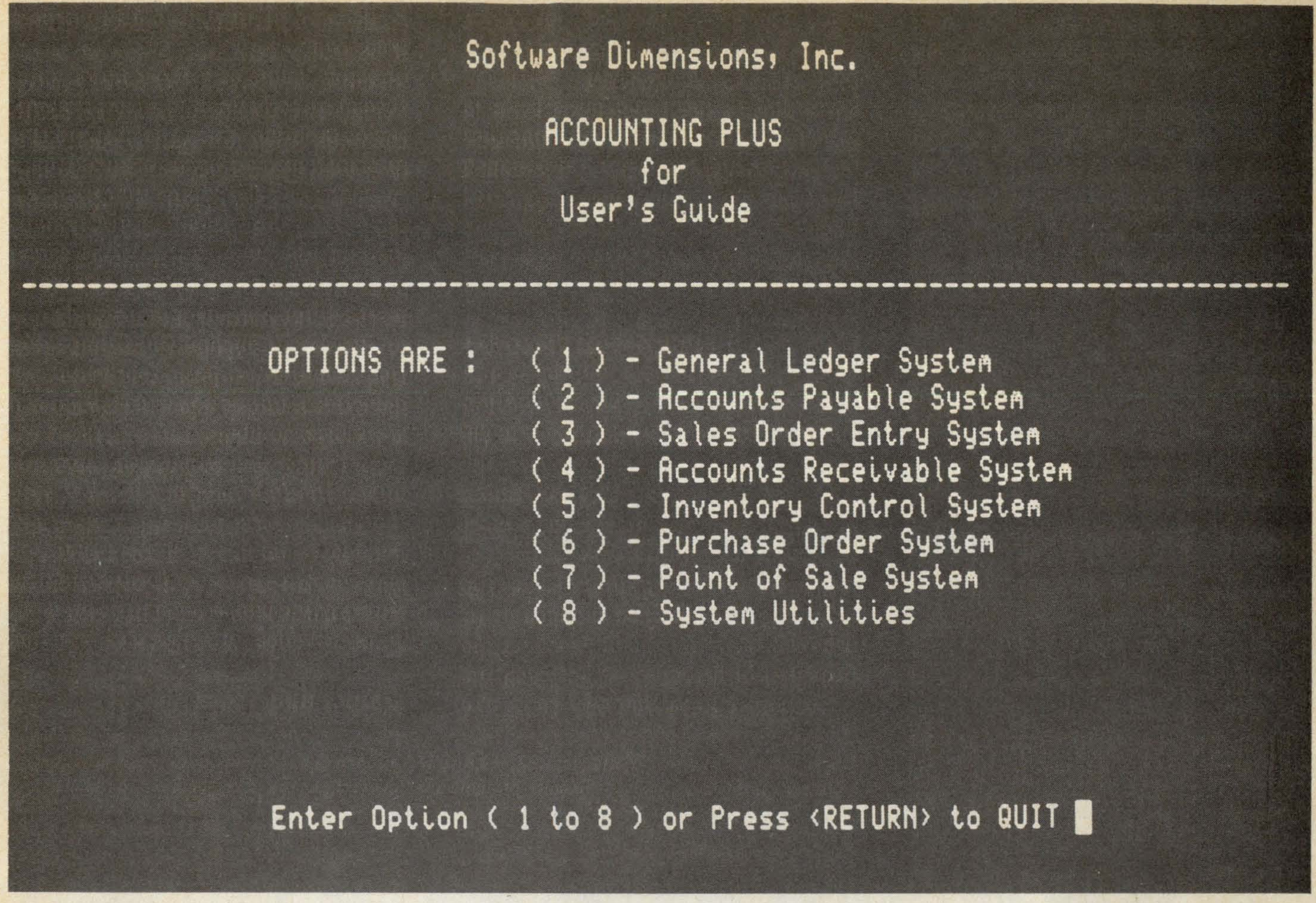
It didn't work out that way. Over a period of several months we used Accounting Plus to manage our business, and discovered many flaws in the package. These flaws prevented us from using Accounting Plus in its intended fashion, so we could not give an honest appraisal of its virtues. In other words, we thought the Accounting Plus package was flawed, and we cannot recommend the version we used (version 3.02). In fact, we wasted a lot of time trying to recover data that was lost after a serious bug in the automatic posting routine caused glitches in the posting.

Typesetting Conventions

Throughout this article we use *THIS typeface* to show exactly what you should type at your keyboard, with the special symbols ↑ for the Control key (CTRL, CNTL or ALT on some keyboards), and ↵ for the Return key (RET, CR or Carriage Return on some keyboards). We also use This Typeface to show messages displayed by the system or by programs.

We didn't like the bug problems, but also, we didn't like Accounting Plus's design. For example, one major complaint was that it was so hard to correct an erroneous entry after it is made in the ledger. An accountant explained that to a certain extent the system cannot let you undo anything you did wrong, because it must keep an accurate audit trail of all transactions, even wrong ones. You must enter adjustment transactions to correct erroneous entries, but unfortunately, our adjustment entries nearly always doubled or compounded the first error.

We wished we had the equivalent of word processing or spreadsheet editing functions when working in the general ledger. This may sound heretical to some accountants, but why not have the freedom to change the ledger entries? An audit trail can be faked any-



```
                    Software Dimensions, Inc.

                        ACCOUNTING PLUS
                              for
                          User's Guide

--------------------------------------------------------------------------------

         OPTIONS ARE :   ( 1 ) - General Ledger System
                         ( 2 ) - Accounts Payable System
                         ( 3 ) - Sales Order Entry System
                         ( 4 ) - Accounts Receivable System
                         ( 5 ) - Inventory Control System
                         ( 6 ) - Purchase Order System
                         ( 7 ) - Point of Sale System
                         ( 8 ) - System Utilities




         Enter Option ( 1 to 8 ) or Press <RETURN> to QUIT █
```

way, so why bother "protecting" it? If such programs can't provide such freedom, why can't they be designed to have a built-in "undo" function to undo transactions properly?

Neither Accounting Plus nor the SBT package lets you "undo" transactions; however, the SBT package is written in dBASE II and uses ordinary dBASE II database files you can edit at will. This straightforward approach makes SBT the choice of those who want access to their data in case something happens, such as a mistaken entry or a disk error.

If you need only a general ledger, you should avoid the larger "business management" packages and settle for an easy-to-use general ledger package. Two general ledger packages are described elsewhere in this issue. If you need an automated accounts receivable, you should read on and look at "business management" packages.

Accounting Plus can be implemented in a hard disk system to have not only general ledger and accounts receivable, but accounts payable, payroll, inventory, sales order, purchase order and point-of-sale. You could effectively manage a retail store with it. (However, we have not seen any retail computer stores using it to run *their* accounting.)

If the brain of any "business management" package is its general ledger chart of accounts, then its heart is the accounts receivable module. Every accounting package offers a "comprehensive accounts receivable module" and most of the bells and whistles of the program exist here.

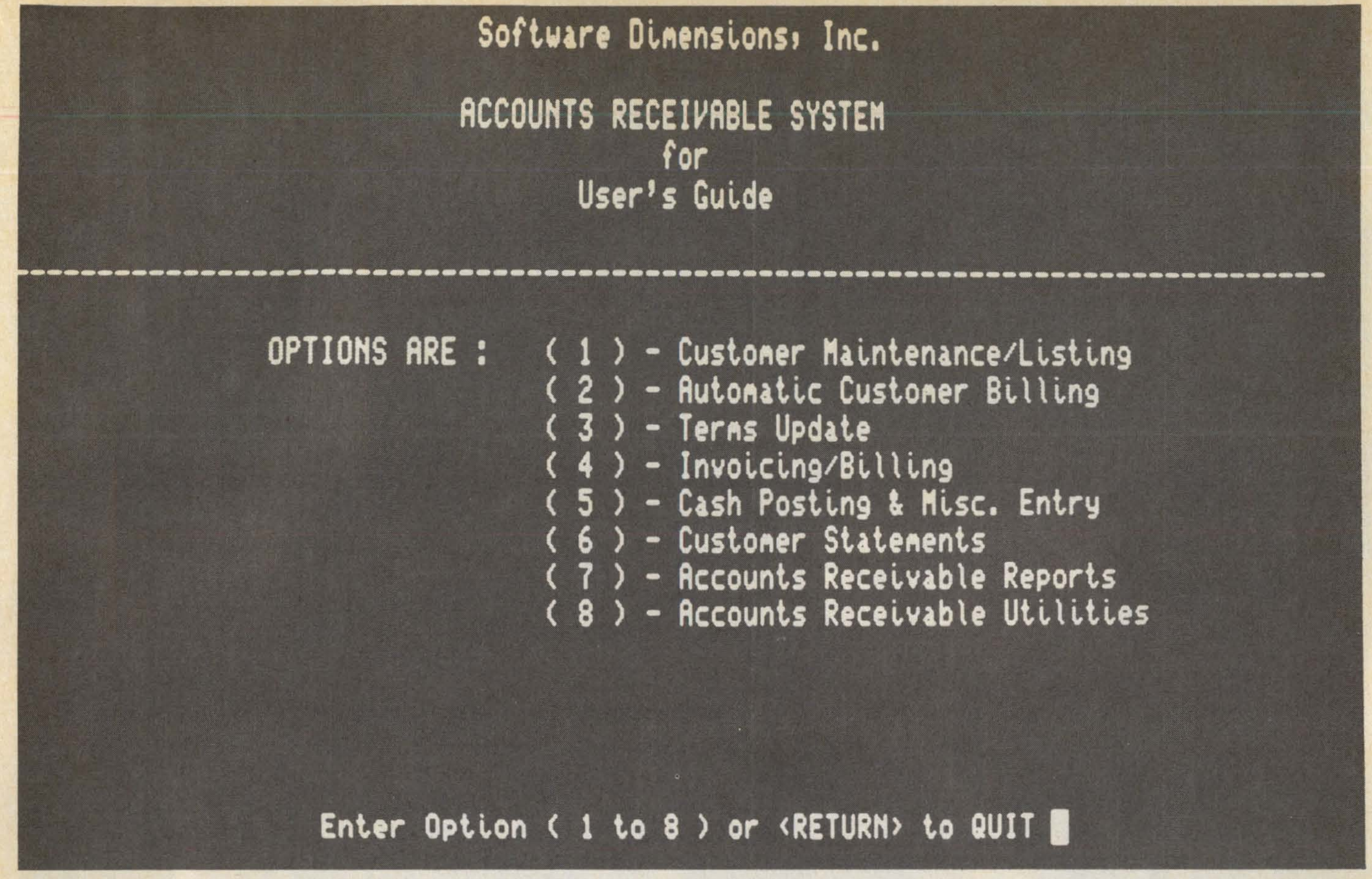
Accounts Receivable

If you're not paying bills, most of the action occurs in the accounts receivable module. Here you are constantly entering new orders, shipping orders and printing invoices, entering payments, credits and debits, and printing monthly statements and reports.

The accounts receivable module does most of this work because you process sales orders more frequently than you pay bills or make general ledger entries. Yet Accounting Plus presents a startup menu of all modules, and you must choose Accounts Receivable to get there.

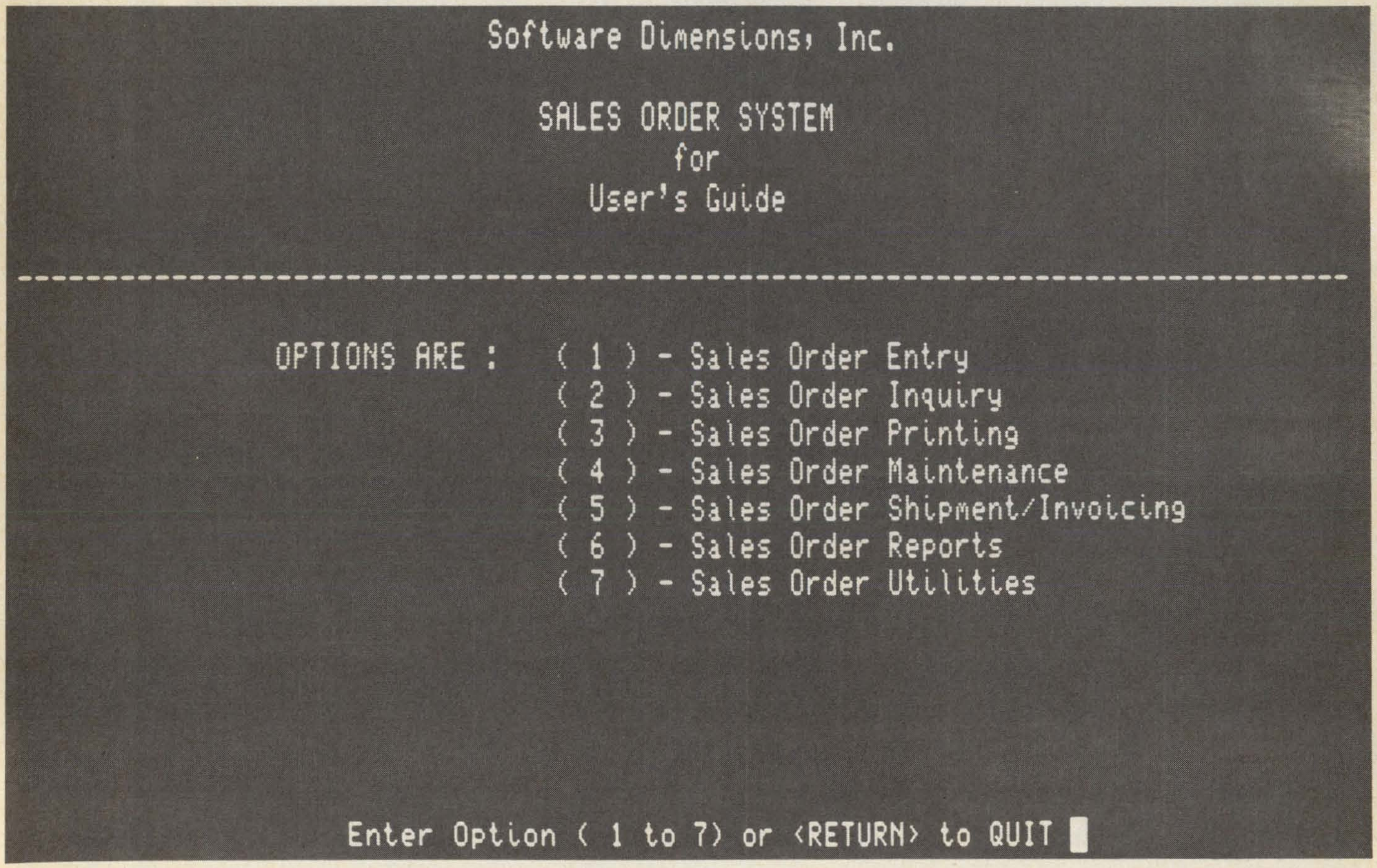
The SBT package runs accounts receivable immediately upon command, but you must already be running dBASE II. If you sign on to dBASE II early in the day supplying the date, you can leave it running to perform data base tasks, then run accounts receivable without re-entering a new program and supplying the date. SBT is quicker than Accounting Plus in reacting to menu selections (both programs were used on the same system).

Accounting Plus lets you have an eight-character customer ID that identifies a specific customer; SBT gives you space for four characters. However, SBT can be changed to suit your needs, whereas Accounting Plus cannot be changed. The cost of using a



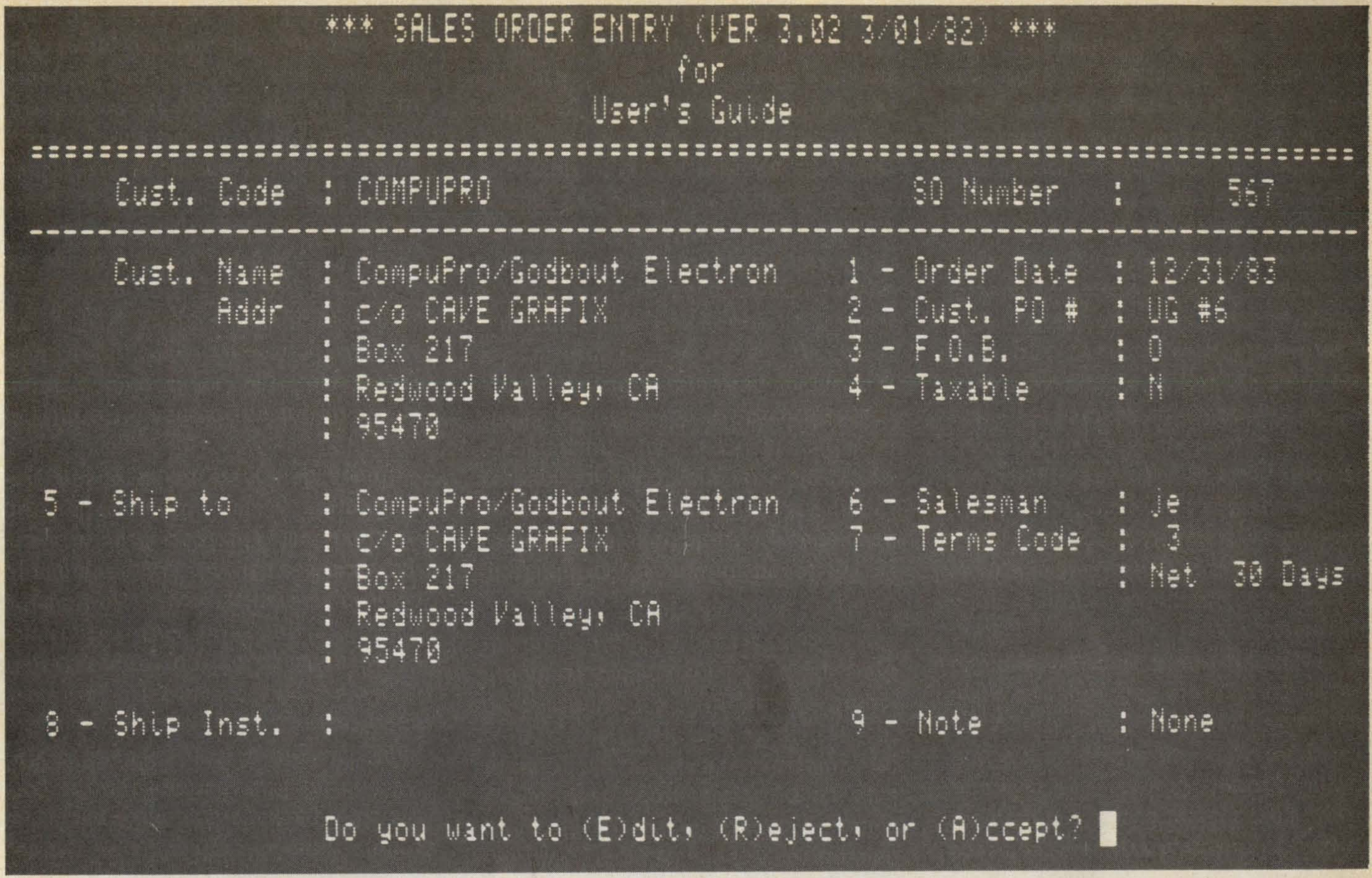
```
                    Software Dimensions, Inc.

                  ACCOUNTS RECEIVABLE SYSTEM
                              for
                          User's Guide

--------------------------------------------------------------------------------

        OPTIONS ARE :   ( 1 ) - Customer Maintenance/Listing
                        ( 2 ) - Automatic Customer Billing
                        ( 3 ) - Terms Update
                        ( 4 ) - Invoicing/Billing
                        ( 5 ) - Cash Posting & Misc. Entry
                        ( 6 ) - Customer Statements
                        ( 7 ) - Accounts Receivable Reports
                        ( 8 ) - Accounts Receivable Utilities




          Enter Option ( 1 to 8 ) or <RETURN> to QUIT
```

Figure 1. *The accounts receivable module of Accounting Plus.*

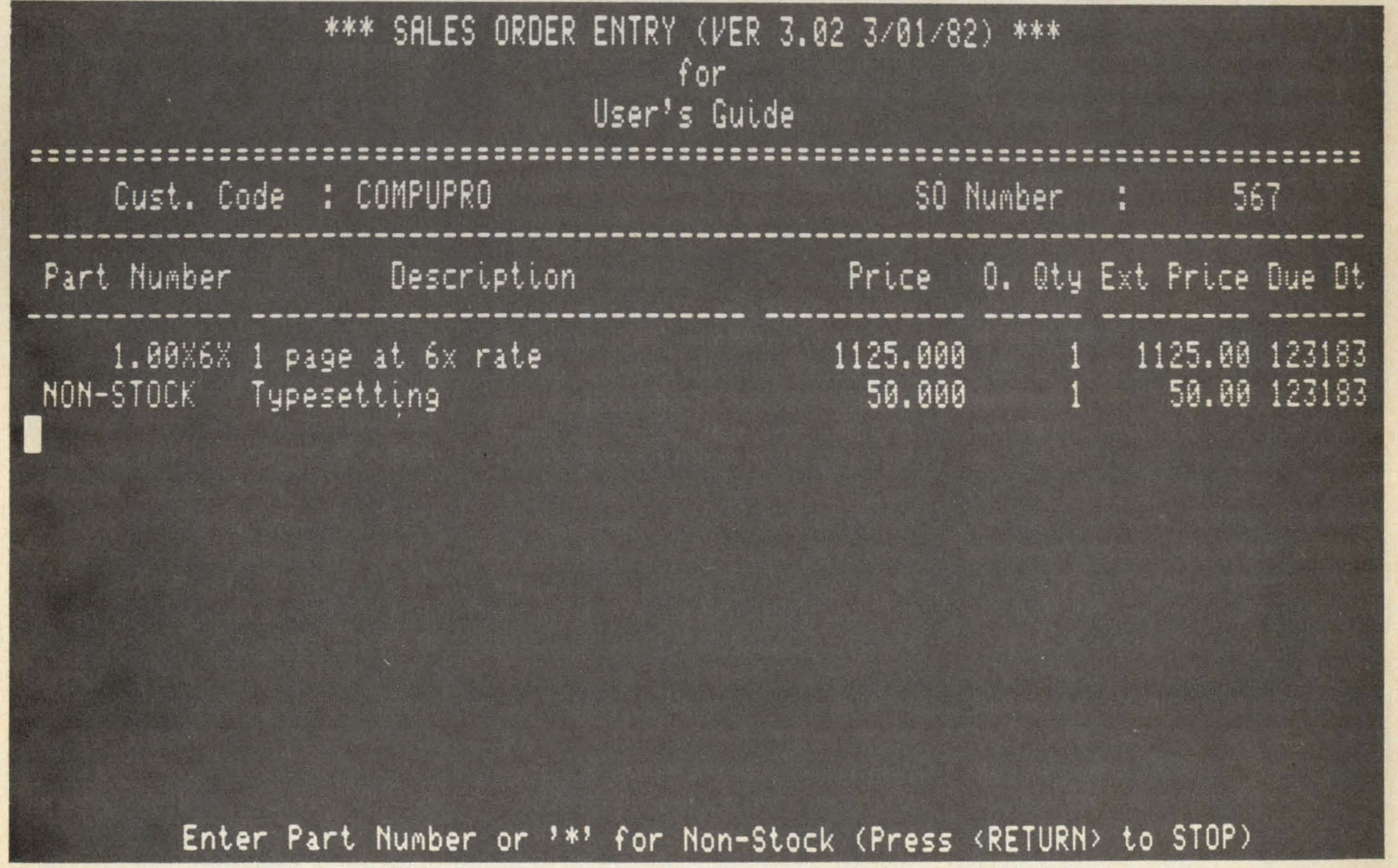


```
                    Software Dimensions, Inc.

                       SALES ORDER SYSTEM
                              for
                          User's Guide

--------------------------------------------------------------------------------

        OPTIONS ARE :   ( 1 ) - Sales Order Entry
                        ( 2 ) - Sales Order Inquiry
                        ( 3 ) - Sales Order Printing
                        ( 4 ) - Sales Order Maintenance
                        ( 5 ) - Sales Order Shipment/Invoicing
                        ( 6 ) - Sales Order Reports
                        ( 7 ) - Sales Order Utilities




           Enter Option ( 1 to 7) or <RETURN> to QUIT
```

Figure 2. *The sales order module of Accounting Plus.*



```
                 *** SALES ORDER ENTRY (VER 3.02 3/01/82) ***
                                    for
                                User's Guide
==============================================================================
    Cust. Code  : COMPUPRO                              SO Number   :       567
------------------------------------------------------------------------------
    Cust. Name  : CompuPro/Godbout Electron   1 - Order Date  : 12/31/83
          Addr  : c/o CAVE GRAFIX             2 - Cust. PO #  : UG #6
                : Box 217                     3 - F.O.B.      : 0
                : Redwood Valley, CA          4 - Taxable     : N
                : 95470

 5 - Ship to    : CompuPro/Godbout Electron   6 - Salesman    : je
                : c/o CAVE GRAFIX             7 - Terms Code  :  3
                : Box 217                                     : Net  30 Days
                : Redwood Valley, CA
                : 95470

 8 - Ship Inst. :                             9 - Note        : None


                Do you want to (E)dit, (R)eject, or (A)ccept? █
```



```
                 *** SALES ORDER ENTRY (VER 3.02 3/01/82) ***
                                    for
                                User's Guide
==============================================================================
    Cust. Code  : COMPUPRO                              SO Number   :       567
------------------------------------------------------------------------------
Part Number          Description               Price    O. Qty Ext Price Due Dt
----------- -------------------------- ------------ ------ --------- ------
    1.00X6X 1 page at 6x rate              1125.000      1   1125.00 123183
NON-STOCK   Typesetting                      50.000      1     50.00 123183
█









        Enter Part Number or '*' for Non-Stock (Press <RETURN> to STOP)
```

Figure 3. *Data entry screen for sales order entry in Accounting Plus.*

consultant's time to change SBT may be prohibitive, but if you already know the dBASE II command language you can do it yourself.

Accounting Plus: A/R, Sales Order, Inventory

The Accounting Plus main menu sends you to the accounts receivable menu (figure 1). Here you can add customers or change their addresses, print invoices, enter cash payments and print statements, among other things.

The automatic customer billing option seemed appropriate for a magazine that sends issues to stores on a regular basis. However, the automatic billing occurs immediately when you close the previous month. Our customers usually increase their order right after an issue is published.

The sales order module in Accounting Plus offers a batch invoicing option that let us type and print our invoices in batches of twenty (we chose twenty as a practical limit for lining up four-part invoice forms in the printer). We did not want to devote the extra disk space to the sales order module, but we had to in order to use this feature of it.

The sales order module works well and would be very useful in tracking the performance of your sales personnel (see figure 2). The point-of-sale module handles over-the-counter sales, but we did not use it.

Sales orders look exactly like invoices (figure 3). You enter each sales order as you would an invoice, using an inventory part number or an asterisk for an item or service not included in inventory. You enter all the sales orders in one batch, then start "shipping" the orders. The shipment process turns orders into invoices. If something happens to cause a glitch or system hiccup at this point, you might have to resort to backup disks and repeat the process.

When typing data for each order, you are asked before performing every major step whether or not to accept or reject the entries you just made. You can "back out" of a sales order, but if you do this from the middle of a batch, you must "ship" and print the ones you have in the batch stream before continuing with new orders.

One major complaint we had with Accounting Plus was the inability to print another copy of the invoice. Accounting Plus spews out one copy whether your printer is ready for it or not. We had many invoices printed on crumpled or nonexisting forms that were not useable. The only solutions were to type in a new order and make adjustments later, or type the invoice on a typewriter.

Accounting Plus usually prints invoices properly. For some reason Accounting Plus could not be tailored to work properly with our Epson MX-100, partly due to the Epson's queer habit of advancing the paper one extra line after a form feed.

Accounting Plus sends a form feed after every invoice, and there is no known way to change it. Therefore, it would always start the second page one line below the top of page, thereby printing the second and subsequent invoices one line too low. Our stopgap solution was to print a dummy invoice as the first one, at a setting one line too high, so that the second and subsequent invoices printed properly.

When entering cash payments, we needed to know the invoice number of the invoice to apply the payment. Accounting Plus displays a message asking if you want to inspect customer invoices, and if you answer *y* for yes, you can type the customer ID and see the invoices that have not been paid. Jot down the invoice numbers (or refer to copies of the original invoices) before moving on to cash posting and miscellaneous entry.

One funny thing about Accounting Plus is that it tries to compensate for requiring an invoice number by letting you "inspect customer invoices." Even after you inspect customer invoices, Accounting Plus displays the message again, asking if you want to inspect customer invoices *again.* (When we first used the program, we needed this redundancy because we forgot to jot down the invoice numbers.)

Cash payment posting is fast, but you must know the invoice number to start posting. You can apply a payment over several invoices easily. The program is set up to let you enter more than one payment per customer; however, if you are only typing one payment per customer, you have to type *S* to stop one customer before typing a new customer ID.

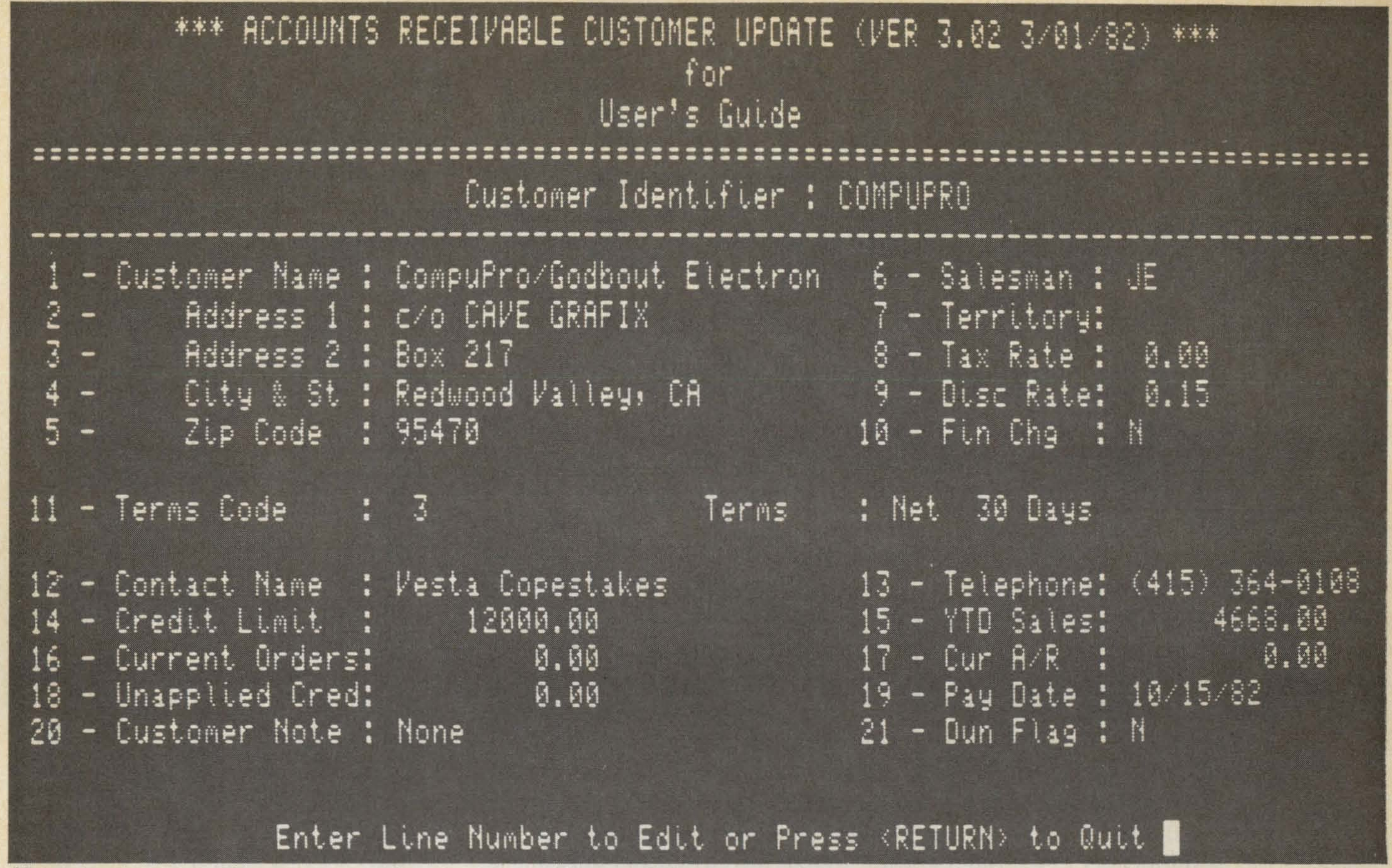
Credits and debits are easily entered, and unapplied credits are stored for later invoices. The system is easy to use, but problems occur in the automatic posting to the general ledger module (described later).

The inventory module is essential for keeping track of inventory. You can get by without the inventory module, but you can't have inventory part numbers — you have to settle with the words "NON-STOCK" printed in the inventory part number field of the invoice. The inventory module gives you direct control over your inventory, including changing the on-hand and on-order quantities.

The inventory module is designed to aid a widget manufacturer who needs to keep track of different types of widgets, yet can estimate easily the cost per unit of each type of widget. The module was not too useful for our purposes because our cost per issue changes according to a variety of factors including the size of the press run, the number of articles, and the number of pages. These problems are detailed later in the description of the automatic posting.

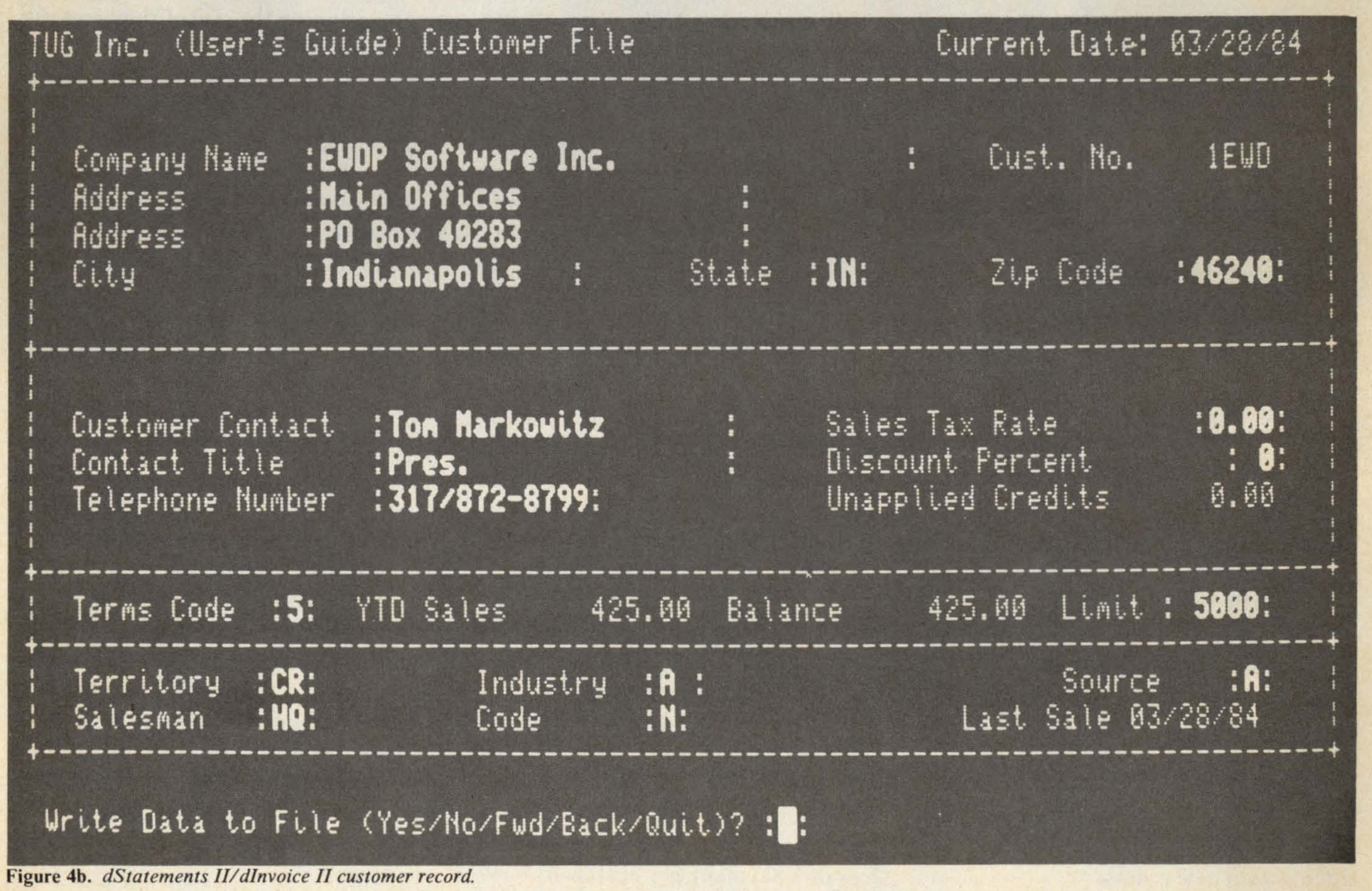
We barely fit the inventory module on the same disk with the general ledger and control information on drive A; however, if you intend to maintain a parts file (we had only a few part numbers representing different magazine issues), you will want to install the entire Accounting Plus package on a hard disk. Accounting Plus is a disk hog but should function well in a hard disk system where there is plenty of room.

You can use Accounting Plus in a floppy disk system but you have to change disks frequently. If you intend to use the sales order module with accounts receivable and a small inventory, you need enough disk space to accommodate both sales order and accounts receivable on drive B, and put the inventory module, the general ledger module, the control information and operating system files on the disk in drive A.



```
*** ACCOUNTS RECEIVABLE CUSTOMER UPDATE (VER 3.02 3/01/82) ***
                              for
                          User's Guide
==========================================================================
                 Customer Identifier : COMPUPRO
--------------------------------------------------------------------------
 1 - Customer Name : CompuPro/Godbout Electron    6 - Salesman : JE
 2 -     Address 1 : c/o CAVE GRAFIX             7 - Territory:
 3 -     Address 2 : Box 217                     8 - Tax Rate :  0.00
 4 -     City & St : Redwood Valley, CA          9 - Disc Rate:  0.15
 5 -     Zip Code  : 95470                      10 - Fin Chg  : N

11 - Terms Code    :  3                Terms    : Net  30 Days

12 - Contact Name  : Vesta Copestakes           13 - Telephone: (415) 364-0108
14 - Credit Limit  :     12000.00               15 - YTD Sales:        4668.00
16 - Current Orders:         0.00               17 - Cur A/R  :           0.00
18 - Unapplied Cred:         0.00               19 - Pay Date : 10/15/82
20 - Customer Note : None                       21 - Dun Flag : N


            Enter Line Number to Edit or Press <RETURN> to Quit █
```

Figure 4a. *Accounting Plus customer record.*



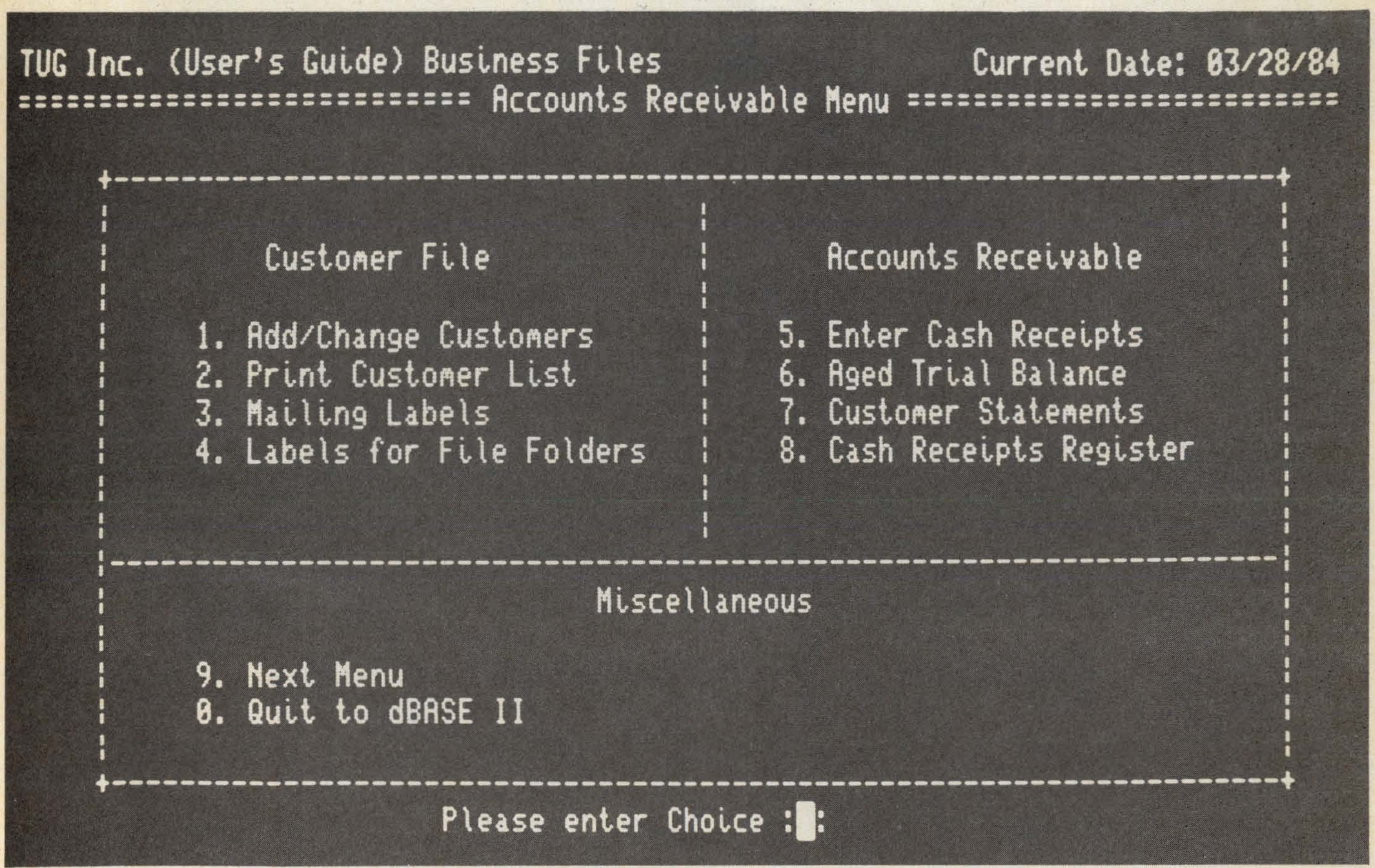
```
TUG Inc. (User's Guide) Customer File                    Current Date: 03/28/84
+-------------------------------------------------------------------------+
¦                                                                         ¦
¦ Company Name    :EVDP Software Inc.                :   Cust. No.   1EWD ¦
¦ Address         :Main Offices         :                                 ¦
¦ Address         :PO Box 40283         :                                 ¦
¦ City            :Indianapolis  :     State  :IN:      Zip Code   :46240: ¦
¦                                                                         ¦
+-------------------------------------------------------------------------+
¦                                                                         ¦
¦ Customer Contact   :Tom Markowitz     :     Sales Tax Rate        :0.00: ¦
¦ Contact Title      :Pres.             :     Discount Percent       : 0: ¦
¦ Telephone Number   :317/872-8799:           Unapplied Credits      0.00 ¦
¦                                                                         ¦
+-------------------------------------------------------------------------+
¦ Terms Code  :5:  YTD Sales    425.00  Balance    425.00  Limit : 5000:  ¦
+-------------------------------------------------------------------------+
¦ Territory  :CR:         Industry  :A :                   Source    :A:  ¦
¦ Salesman   :HQ:         Code      :N:                Last Sale 03/28/84 ¦
+-------------------------------------------------------------------------+

 Write Data to File (Yes/No/Fwd/Back/Quit)? :█:
```

Figure 4b. *dStatements II/dInvoice II customer record.*

If you can't fit both modules on the disk in drive B, you may find yourself switching disks often while trying to do basic accounts receivable operations, because if you are typing a sales order for a new customer and you forgot to add the new customer, you have to switch to accounts receivable. If this involves a disk change, you have to "back out" completely from Accounting Plus, switch disks, then re-enter Accounting Plus and go down into the accounts receivable module. All this to add one new customer!

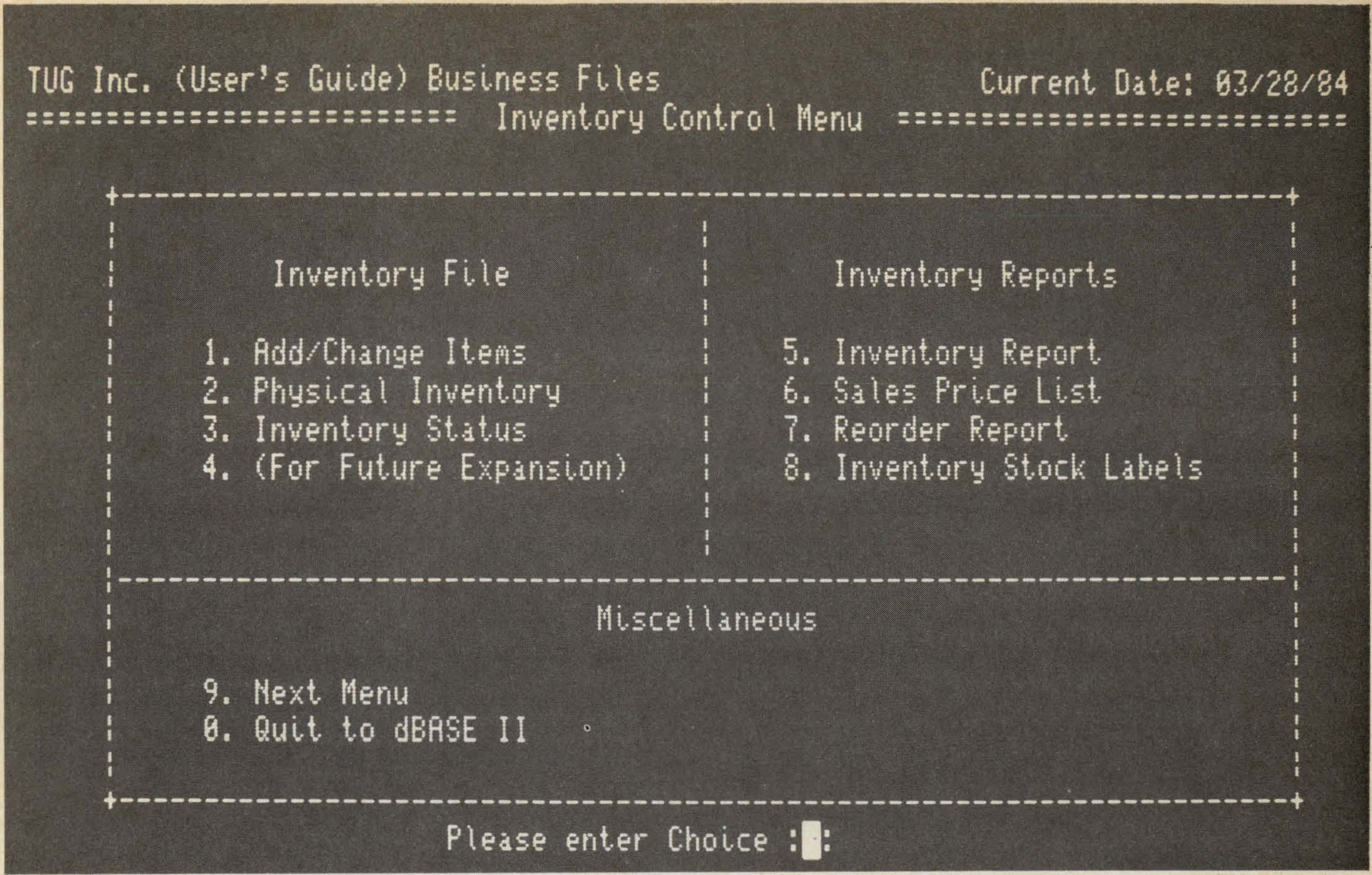
If you like Accounting Plus's features and functionality, and if you intend to use more than just the general ledger, sales order and accounts receivable modules at the same time (e.g., purchase orders and inventory), then you generally need a hard disk. With a hard disk you can also install the other less frequently used modules (payroll and accounts payable).

Our plan was to use an accounting package like Accounting Plus to run our magazine business, and then write a tutorial on how to use the package to run almost any business. It didn't work out that way.



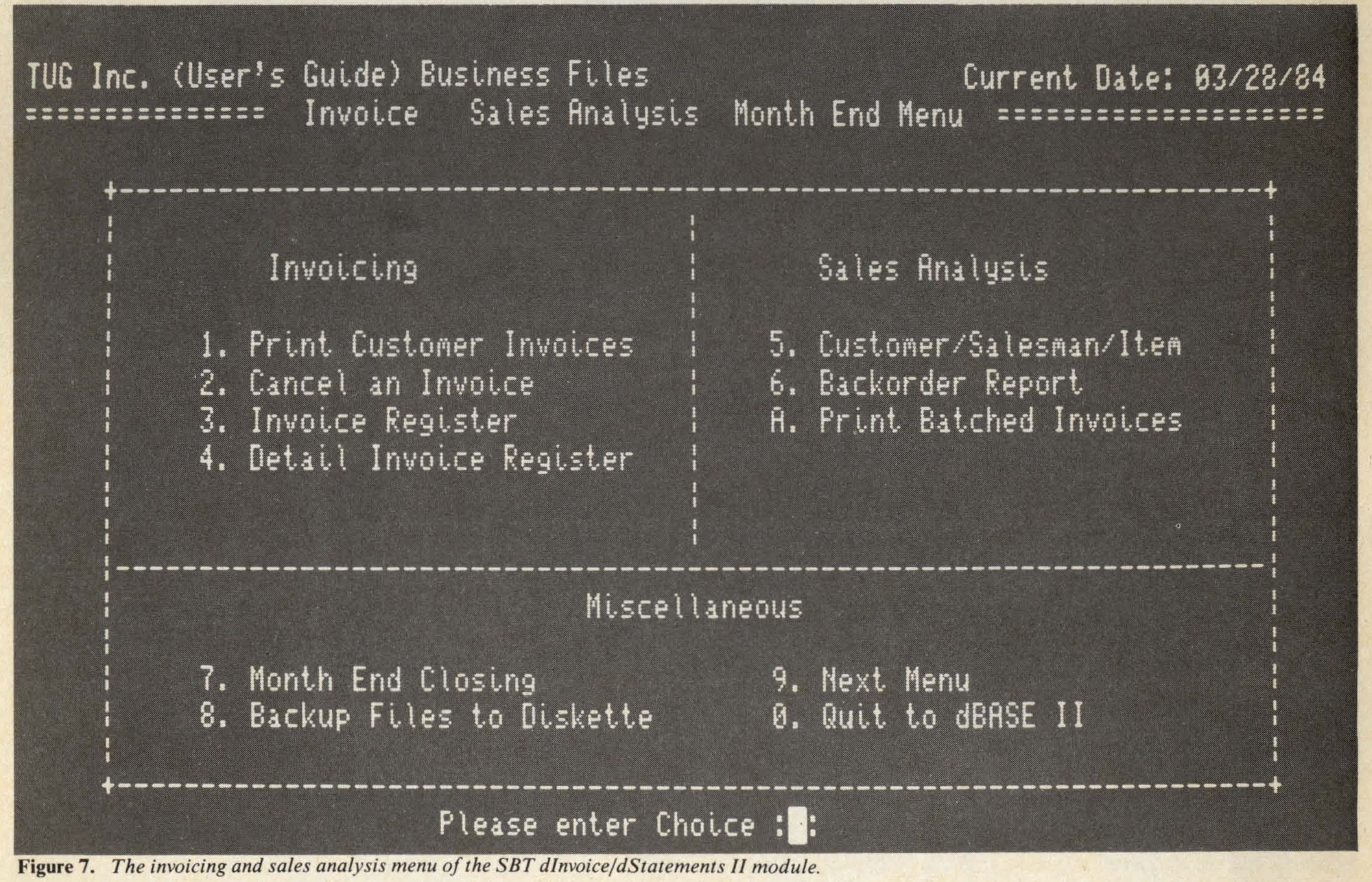
```
TUG Inc. (User's Guide) Business Files                  Current Date: 03/28/84
========================== Accounts Receivable Menu ==========================

     +---------------------------------------------------------------------+
     :                                  :                                  :
     :       Customer File              :      Accounts Receivable         :
     :                                  :                                  :
     :   1. Add/Change Customers        :   5. Enter Cash Receipts         :
     :   2. Print Customer List         :   6. Aged Trial Balance          :
     :   3. Mailing Labels              :   7. Customer Statements         :
     :   4. Labels for File Folders     :   8. Cash Receipts Register      :
     :                                  :                                  :
     :                                  :                                  :
     :---------------------------------------------------------------------:
     :                          Miscellaneous                              :
     :                                                                     :
     :   9. Next Menu                                                      :
     :   0. Quit to dBASE II                                               :
     :                                                                     :
     +---------------------------------------------------------------------+
                          Please enter Choice : :
```

Figure 5. *The accounts receivable menu of the SBT dInvoice/dStatements II module.*



```
TUG Inc. (User's Guide) Business Files                         Current Date: 03/28/84
========================  Inventory Control Menu  ===========================

    +-------------------------------------------------------------------+
    |                                 |                                 |
    |         Inventory File          |        Inventory Reports        |
    |                                 |                                 |
    |     1. Add/Change Items         |     5. Inventory Report         |
    |     2. Physical Inventory       |     6. Sales Price List         |
    |     3. Inventory Status         |     7. Reorder Report           |
    |     4. (For Future Expansion)   |     8. Inventory Stock Labels   |
    |                                 |                                 |
    |-------------------------------------------------------------------|
    |                          Miscellaneous                            |
    |                                                                   |
    |     9. Next Menu                                                  |
    |     0. Quit to dBASE II                                           |
    |                                                                   |
    +-------------------------------------------------------------------+
                          Please enter Choice : :
```

Figure 6. *The inventory menu of the SBT dInvoice/dStatements II module.*



```
TUG Inc. (User's Guide) Business Files                         Current Date: 03/28/84
==============  Invoice   Sales Analysis  Month End Menu  ===================

    +-------------------------------------------------------------------+
    |                                 |                                 |
    |         Invoicing               |        Sales Analysis           |
    |                                 |                                 |
    |     1. Print Customer Invoices  |     5. Customer/Salesman/Item   |
    |     2. Cancel an Invoice        |     6. Backorder Report         |
    |     3. Invoice Register         |     A. Print Batched Invoices   |
    |     4. Detail Invoice Register  |                                 |
    |                                 |                                 |
    |-------------------------------------------------------------------|
    |                          Miscellaneous                            |
    |                                                                   |
    |     7. Month End Closing              9. Next Menu                |
    |     8. Backup Files to Diskette       0. Quit to dBASE II         |
    |                                                                   |
    +-------------------------------------------------------------------+
                          Please enter Choice : :
```

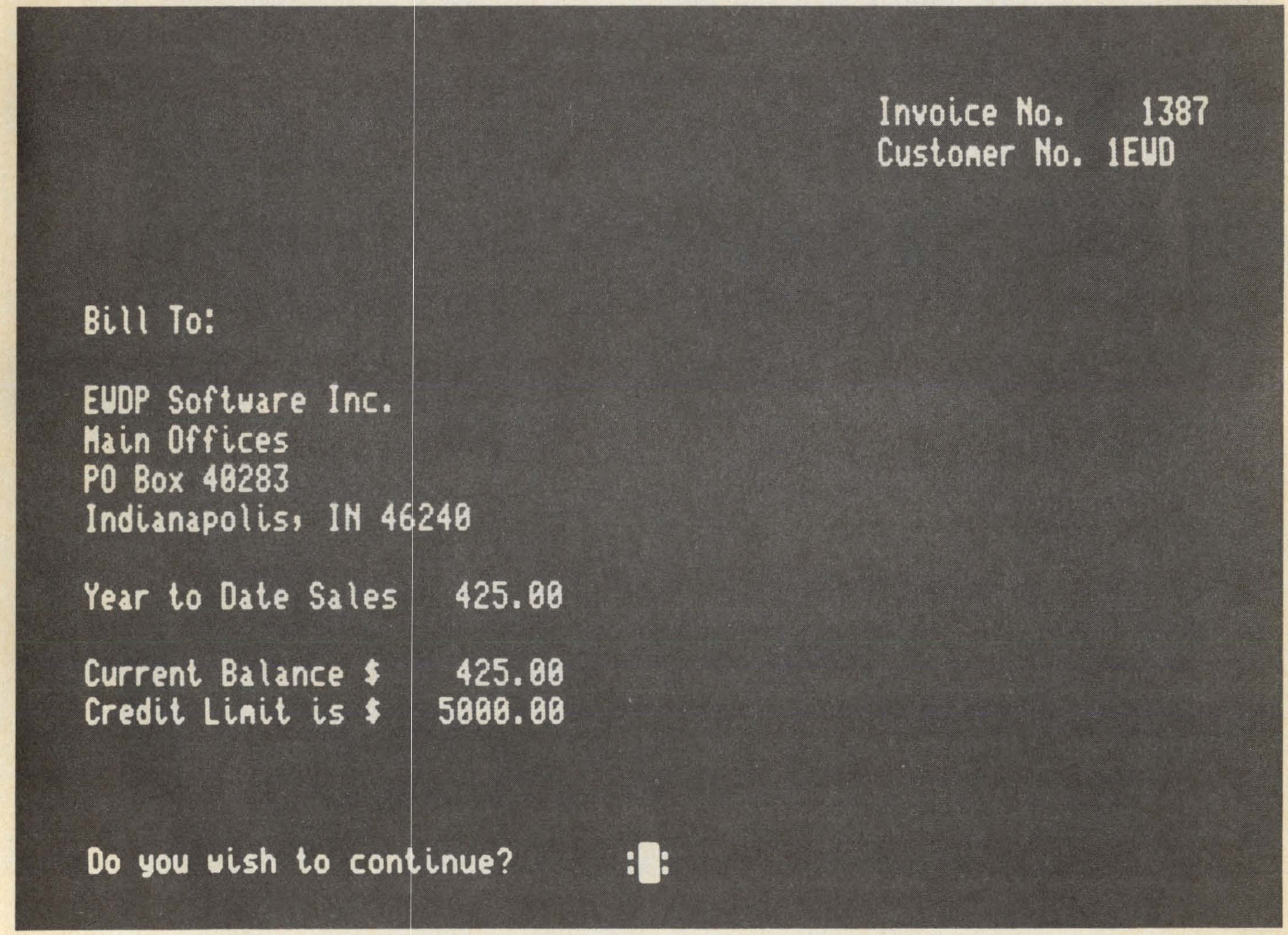
Figure 7. *The invoicing and sales analysis menu of the SBT dInvoice/dStatements II module.*

SBT: dInvoice/dStatement II

The SBT accounting system includes dStatements II/dInvoice II (accounts receivable), dPayables, dPurchases, dPayroll and dLedger. We are comparing in this article the dStatements II/dInvoice II module with Accounting Plus's accounts receivable module. Figure 4a shows how Accounting Plus keeps track of customers; figure 4b shows how the SBT module keeps track of customers.

The SBT package runs under dBASE II, and you can use dBASE II commands to examine and edit any database file. Figure 5 shows the first accounts receivable menu that gives you access to the customer file, cash receipts entry and statement printing. You can print customer listings and mailing labels. You can also move on to the next menu (figure 6).

We wished we had spreadsheet editing functions when working in the general ledger. This may sound heretical to some accountants, but why not have the freedom to change the ledger entries?



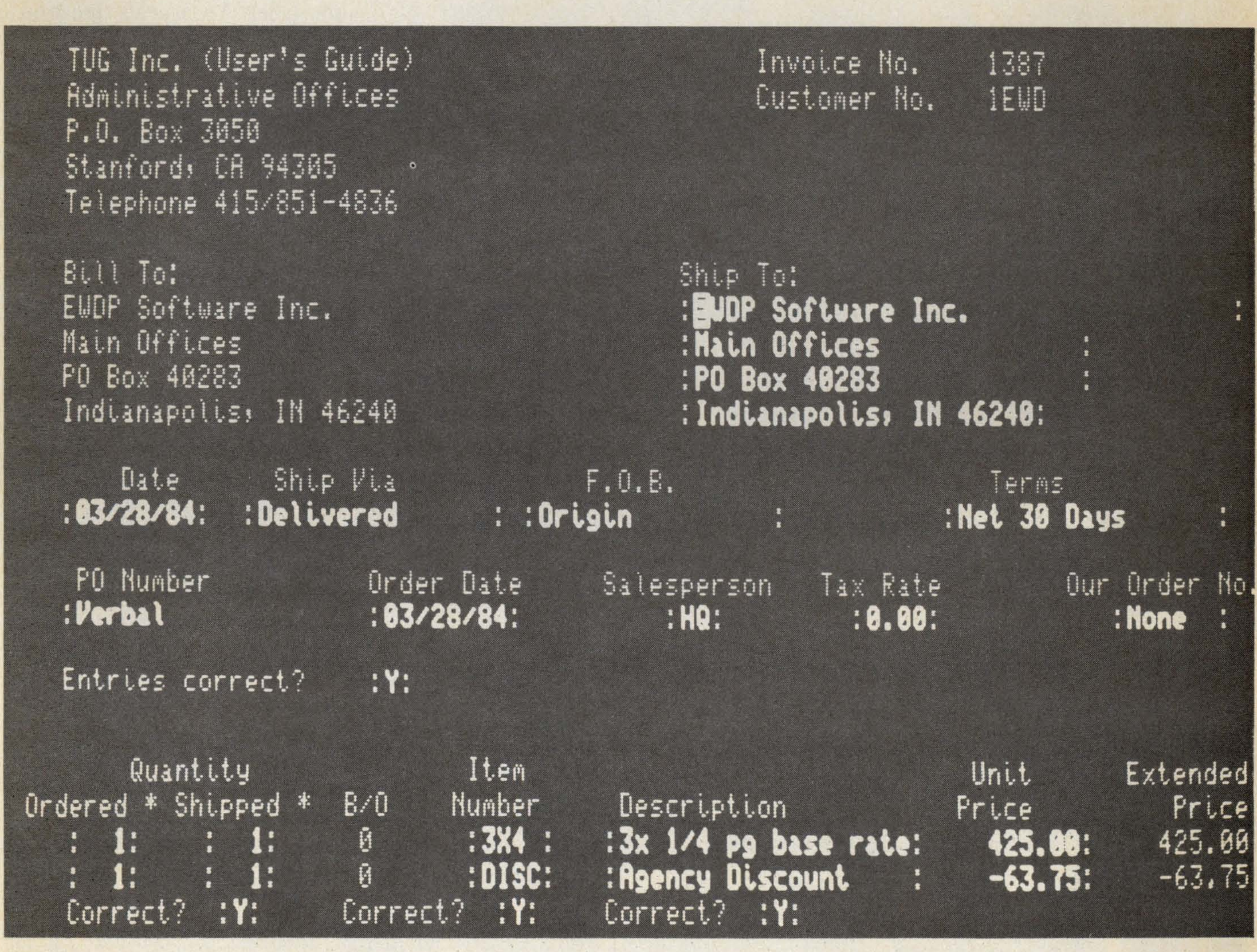
```
                                        Invoice No.    1387
                                        Customer No. 1EWD



  Bill To:

  EWDP Software Inc.
  Main Offices
  PO Box 40283
  Indianapolis, IN 46240

  Year to Date Sales     425.00

  Current Balance $      425.00
  Credit Limit is $     5000.00



  Do you wish to continue?        : :
```

Figure 8. *Using the SBT dInvoice/dStatements II module to start invoicing. After you select a customer, it displays the customer's name, billing address and credit limit before proceeding.*

The menus are designed to follow each other. Following the menu in figure 6 is the menu in figure 7, which is followed by the menu in figure 5. You can cycle through the three menus very quickly. SBT assumes that your response is to move to the next menu (response *9*); you can type a response or simply use Return to select *9* as the default response and move to the next menu.

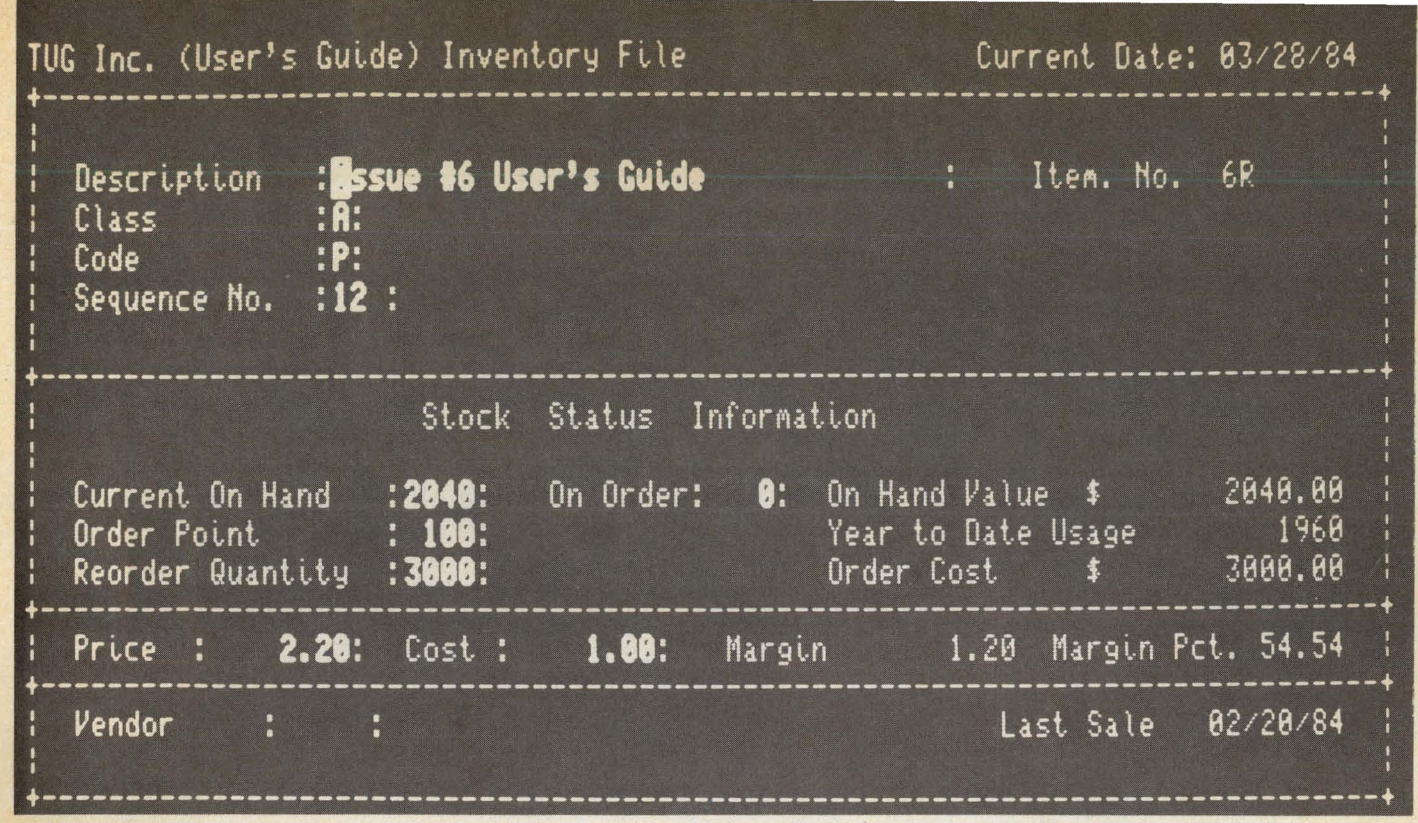
The menu in figure 7 provides invoicing and sales analysis. Here you can create and print an individual invoice or create a batch of invoices to print at any time. You can also print a detail report, close the month (and print month closing reports), and perform a disk backup from this menu.

> **One major complaint we had with Accounting Plus was the inability to print another copy of the invoice.**



```
   TUG Inc. (User's Guide)                              Invoice No.    1387
   Administrative Offices                               Customer No.   1EWD
   P.O. Box 3050
   Stanford, CA 94305
   Telephone 415/851-4836

   Bill To:                                         Ship To:
   EWDP Software Inc.                               :EWDP Software Inc.                  :
   Main Offices                                     :Main Offices              :
   PO Box 40283                                     :PO Box 40283              :
   Indianapolis, IN 46240                           :Indianapolis, IN 46240:

      Date       Ship Via            F.O.B.                        Terms
   :03/28/84:  :Delivered      : :Origin          :          :Net 30 Days       :

    PO Number           Order Date      Salesperson    Tax Rate        Our Order No.
   :Verbal              :03/28/84:          :HQ:          :0.00:          :None   :

   Entries correct?     :Y:

       Quantity                Item                                 Unit      Extended
 Ordered * Shipped *   B/O    Number      Description              Price         Price
   :  1:    :  1:       0     :3X4  :   :3x 1/4 pg base rate:    425.00:       425.00
   :  1:    :  1:       0     :DISC:    :Agency Discount     :    -63.75:       -63.75
   Correct?  :Y:      Correct?  :Y:     Correct?  :Y:
```

Figure 9. *The invoice entry screen of the SBT package is easy to fill out using dBASE II editing commands.*



```
TUG Inc. (User's Guide) Inventory File                  Current Date: 03/28/84
+----------------------------------------------------------------------------+
|                                                                            |
|                                                                            |
| Description   :Issue #6 User's Guide               :    Item. No.  6R      |
| Class         :A:                                                          |
| Code          :P:                                                          |
| Sequence No.  :12 :                                                        |
|                                                                            |
|                                                                            |
+----------------------------------------------------------------------------+
|                                                                            |
|                      Stock  Status  Information                            |
|                                                                            |
|                                                                            |
| Current On Hand    :2040:   On Order:   0:  On Hand Value  $       2040.00 |
| Order Point        : 100:                   Year to Date Usage        1960 |
| Reorder Quantity   :3000:                   Order Cost     $       3000.00 |
+----------------------------------------------------------------------------+
| Price  :      2.20:  Cost :     1.00:    Margin        1.20  Margin Pct. 54.54 |
+----------------------------------------------------------------------------+
| Vendor       :      :                                 Last Sale   02/20/84 |
|                                                                            |
+----------------------------------------------------------------------------+
```

Figure 10. *The inventory maintenance screen of the SBT package gives you full control over on-hand quantities and costs.*

We found the dInvoice/dStatements II module more useful than the Accounting Plus accounts receivable module. The SBT module lets you create a batch of invoices and print them at a later time. You can print as many copies of each invoice as you like. We found one minor bug in the program — when you elect to create and print an individual invoice, the command file that does it has a syntax error. This is easily fixed with a word processing program, and newer versions are already fixed.

When you select a customer for invoicing, the program displays the customer name and credit limit, and asks if you want to proceed (figure 8). This pause in the invoicing is intentional to allow you to skip a customer who hasn't paid on past invoices or who has otherwise extended the credit limit.

Note that in Accounting Plus you don't know a customer's credit limit or payment history, but Accounting Plus sounds a beep tone if a customer's line of credit is exceeded. We think SBT's approach (simply displaying the customer's information) is a better one.

The actual invoice header and item-by-item description (figure 9) is very easy to fill out. You can use the dBASE II editing commands, and you can quit from an invoice easily. Default responses are provided (most "yes" or "no" answers where appropriate). You can step quickly through invoice generation, skipping over fields you don't need. You can also modify the invoice command file to put default entries in some of the invoice fields.

One clear advantage SBT has over Accounting Plus is the ability to print copies of an invoice. After printing an individual invoice or a batch of invoices, you are asked if you want to print more copies. The invoices stay in a special printing file until you stop the invoicing process. At that point SBT asks if you want to delete the invoices from the printing stream. Only after deleting them is it impossible to print copies.

An outstanding feature of SBT is the ability to cancel an invoice after you've entered it and printed it. This option asks you for an invoice number, and asks for confirmation before proceeding. If you confirm, it deletes the invoice and updates all affected files to give you a clean adjustment.

The SBT package also excels over Accounting Plus in entering cash receipts. When you enter the customer's ID number, the earliest unpaid invoice is automatically displayed for you to apply the payment. You can apply a payment to more than one invoice, or partially pay an invoice. You can also skip the earliest unpaid invoice and apply the payment to the next one.

The inventory menu (figure 6) gives you all the options found in Accounting Plus's inventory module. You don't need a separate inventory module with SBT. You can change the on-hand and on-order quantities, and provide cost estimates and prices for each part. The on-hand value, order cost, margin and margin percentages are automatically calculated (figure 10). You can assign your own class and sequence numbers and letter codes, although the letter code "P" is used to designate an item to be included in the sales price listing.

Because we accept whole magazine returns from stores, we have to be able to credit the store for unsold magazines *and* add the usable magazines to our back issue inventory. Accounting Plus lets us apply credits to invoices, but we have to manually change our on-hand inventory quantities. SBT lets us generate a negative invoice for returns thereby automatically updating inventory as well as accounts receivable. We were also able to have our version customized so that negative invoices cancelled previous outstanding invoices.

Printing invoices and statements is a breeze with SBT. Your printer settings are set during normal dBASE II instal-

```
                         POSTING TABLE
                         As of  4/ 6/84

LINE      CATEGORY          ACCT  DEPT         LINE      CATEGORY          ACCT  DEPT
---- ---------------- ------   --          ---- ---------------- ------   --

                                                                               Page 1

  1  Inventory Acct     1800    0            16  Inv Misc Issues    7075    0
  2  Cost of Goods      6000    0            17  Inv Adjustments    7075    0
  3  Sales Account      5000    0            18  Accts Payable      3000    0
  4  Accts. Rec.        1100    0            19  A/P Disc Taken     5800    0
  5  A/R Misc Income    5800    0            20  A/P Cash Acct      1000    0
  6  A/R Freight Exp    7125    0            21  Reserved              0    0
  7  A/R Discounts      5050    0            22  Reserved              0    0
  8  A/R Tax Collect    3025    0            23  Reserved              0    0
  9  A/R Cash Rec.      1000    0            24  Reserved              0    0
 10  A/R Finance Chg    8000    0            25  Reserved              0    0
 11  A/R Cr/Dr Memos    5800    0            26  Reserved              0    0
 12  Reserved              0    0            27  Reserved              0    0
 13  A/R Deposits       3900    0            28  Reserved              0    0
 14  Reserved              0    0            29  Reserved              0    0
 15  Inv Misc Recpts    7075    0            30  Reserved              0    0

==========================================================================

                                                                               Page 2

 31  Sales Account 2    5100   10            41  COGS Acct 2        6025   10
 32  Sales Account 3    5200   20            42  COGS Acct 3        6050   20
 33  Sales Account 4    5300   30            43  COGS Acct 4        6100   30
 34  Sales Account 5    5400   40            44  COGS Acct 5        6150   40
 35  Sales Account 6    5500   50            45  COGS Acct 6        6200   50
 36  Sales Account 7    5550   60            46  COGS Acct 7        6250   60
 37  Sales Account 8    5600   50            47  COGS Acct 8        6300   50
 38  Sales Account 9    5650   60            48  COGS Acct 9        6700   60
 39  Sales Account 10   5700   60            49  COGS Acct 10       6700   60
 40  Reserved              0    0            50  Reserved              0    0
```

Figure 11. *The posting table in Accounting Plus where the automatic posting occurs. Posting accounts correspond to actual accounts in the chart of accounts.*

lation, and SBT simply runs under dBASE II. SBT can print invoice data on preprinted forms that are either 10 lines or 12 lines per inch (default is 10). All reports can be printed on standard 8.5 x 11 paper.

Automatic Posting From Accounts Receivable

Accounts payable modules are usually closely linked to the general ledger chart of accounts. A well-defined chart of accounts can make a ledger function also as a budgeting tool. Most payable modules automatically post to the general ledger, and we had no trouble (except once, a disk error with Accounting Plus) with either package. Payables are discussed in the next installment.

Receivables don't have to be closely linked to the ledger. They should function independently, quickly performing the function of making it easy for you to retrieve your money. Nevertheless, at the end of each month or period, you close the month and post summary data to the general ledger.

SBT can be set up for automatic or manual posting of accounts receivable data to the general ledger. Accounting Plus is set up for automatic posting only, although you can post manually using the general ledger's journal voucher entry. In both packages you can get account totals from detail transaction reports.

SBT gives you access to transaction data in dBASE II files that are almost self-explanatory; Accounting Plus gives you CBASIC files that are not self-explanatory but are readable by a word processing program. However the manipulation facilities in dBASE II are far better suited for handling accounting files than typical word processing programs; besides, the Accounting Plus data files are not documented (SBT describes the contents of their accounting files).

Our problems with Accounting Plus centered around the automatic posting. Automatic posting occurs through a posting table that matches sales accounts to cost-of-goods-sold accounts and an inventory account. The posting table has an account for discounts (miscellaneous income or expense) and accounts for cash and receivables (figure 11).

The posting table has several entries for different sales accounts, and a corresponding cost of goods sold account for each sales account. This would work perfectly for a manufacturer of widgets of different types — each type would have a sales account and corresponding cost of goods sold account. The sales and COGS accounts would be updated whenever a new widget replaced an obsolete one, thus the value of inventory would then be updated correctly.

The cost of a magazine, however, is different for each issue. Each new issue does not obsolete the previous issue, and we could not have a different sales account for each issue. We divided our sales accounts into subscription sales, retail/wholesales sales, ad space sales, reprint sales, etc. There are no cost of goods accounts that can be associated with each sales account. Consequently we could not use the inventory module to calculate inventory worth, nor could we update inventory worth with each sale.

We would have been better off with one sales account for magazines and one cost of goods account that combines all magazine expenses into one account. We did not know this until much later. The documentation about the automatic posting of Accounting Plus did not give us any clues.

Also, we were plagued by a mysterious bug. During the month closing operation, the Accounting Plus transaction file was glitched by some mysterious action that caused the message ERROR OE (a CBASIC run-time error message not adequately explained in the CBASIC manual and not mentioned whatsoever in Accounting Plus manuals).

The dealer who sold us the package (Systems Plus, Palo Alto, CA) offered a $60/hour consultant rather than appropriate support. After convincing someone there that our problem was related to a bug in the package, they referred us to technical support people who told us to re-type the data onto fresh disks.

We did not want to re-type over 250 invoices, so we investigated the files with a text editor and deciphered the data fields. (The manual does not tell you that the files contain text you can read with a text editor.) Then we entered the posting manually through the general ledger voucher entry process.

There is no substitute for keeping a backup copy of each stage of your accounting operation. For example, we kept a copy of the system as it was before entering the invoices, and a copy of the system before we tried to do a month closing, etc. We went back to the copy of the system before month closing, and recovered the account totals from that disk.

We found automatic posting from accounts receivable to be more trouble than its worth. Using the SBT package we can close the month for accounts receivable and have four summary accounts to post to: sales, cash, accounts receivable and sales adjustment (returns). You can have as many sales accounts as you wish. Post manually using journal voucher entries.

Compare this to the automatic posting of Accounting Plus of an advertising space sale less agency discount: It posts the ad's full price to sales and cash, then adjusts cash with a posting of the agency discount to a "miscellaneous income and expense" account. Why not post an adjusted amount to sales and cash?

To make automatic posting occur properly in Accounting Plus, the invoice typist must type the correct posting number from the *posting table* for the account (not actual chart of account number, which would make more sense).

By far the greatest problem with automatic posting is the possibility of a disk or system error occurring during the posting. You would think the reverse is true — that manual posting would cause more errors. This should be the case, but given the failure rate of some disks and systems, you may be better off with a nice clean *manual* step from closing the accounts receivable month to posting the summary data in the general ledger.

With a dBASE II accounting system, you have the ability to do both automatic and manual posting. If a disk or system failure occurs, you can usually recover the dBASE II data file used for posting.

Conclusion

What do we use now for our accounts receivable? Right now we use the SBT package. We have put aside Accounting Plus, perhaps forever, perhaps not (the payroll package is still unopened).

We use SBT because it is fast, easy to use, and a relief from programs that hide the data. With a dBASE II accounting system, it is easy to find the data and use dBASE II commands to manipulate it. This is also true with any accounting system designed to run within a data base management system.

We also use it because it prints invoices *and copies* of invoices without any problems. We have no trouble printing statements either.

We run the SBT dInvoice/dStatements II module by itself, and use the reports to post directly into the general ledger. Eventually we will set up automatic posting from accounts receivable, but this is not necessary. We use up to five sales accounts with corresponding sales adjustments accounts, one cash account, and two receivables accounts. These are easy to post manually.

The ability to stop the SBT program and fix or change it is perhaps the single most important reason for our liking it. We are not programmers, but we understand dBASE II commands, and SBT provides the source code files for the entire package. You can edit these source code files with any word processing program.

In the next installment we'll cover another dBASE II accounting system: CHAMPION. We'll also compare the accounts payable modules of all these systems.

MS-DOS and PC-DOS, Part II

An introduction to the MS-DOS file storage technique from a CP/M user's point of view.

by Steve Rosenthal

© 1984 Steve Rosenthal

One of the main tasks that any disk operating system does for you is to store and find data on your computer's disks. MS-DOS, as an evolutionary descendent of CP/M, uses some of the same file storage techniques. But despite an overall conceptual similarity, the details of file handling and storage are quite different in MS-DOS than in CP/M, and the differences affect ordinary users as well as more serious programmers.

Of course, you don't have to know all the details of the inner workings of the system to use either CP/M or MS-DOS. However, by looking at some of the structural changes, some of the differences in performance should make a lot more sense. If you're not a technical person, bear with me — you don't have to memorize the precise details of the structure to see how they affect they way you work with the system.

As in the last installment, unless otherwise specified everything said about MS-DOS applies to PC-DOS (the version of MS-DOS used on the IBM PC series). Anything said about PC-DOS does not necessarily apply to the more generic MS-DOS.

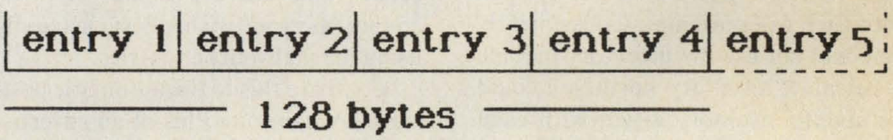


Figure 1. *In both CP/M and MS-DOS, the principal directory entry for each file occupies a 32-byte long space on the disk, allowing an even number to fit into sectors that are multiples of 128 bytes long.*

Files And Directories

In both MS-DOS and CP/M systems, information on the disk consists of three types of entries: system information, the disk directory, and the file area. The system area has code to run the hardware plus various tables. The directory shows what files are present on the disk, and where they are stored. The file area consists of the actual data, including user programs, parts of the operating system in program form ("transients" or "external programs"), and data files.

In MS-DOS, as in CP/M, files are the basic conceptual unit of data and program storage. Even though the disk is electronically divided into tracks and physical records, the only time that you notice tracks and records is when something goes wrong. During normal use, you interact with the disk storage routines by asking them to perform operations on logical files, or on records defined by their positions within the file. It's the DOS's job to translate from files and "relative logical records" to the actual physical track and record on the disk.

A file, in this context, is a grouping of data areas (including programs as a special type of data) that the DOS treats as a group. For example, BASIC programs, the BASIC interpreter itself, Wordstar, documents created with Wordstar, and most games are all files. Files can be named, renamed, copied, deleted, read from or written to. To access the information in a file, you don't have to know where it is physically located on the disk, as the DOS keeps track of that.

From the DOS's point of view, files are collections of disk records claimed by one of the file names listed in the disk directory. The DOS does not worry about the content of the file, nor whether the name fairly describes what the file does or should be used for — only how to get information back and forth from the disk.

In versions starting with 2.0, MS-DOS goes even further and allows you to completely bypass both physical details and the DOS records — using a set of added file routines, you can have your programs treat files as long strings of data similar to stretches of memory, reading and writing by specifying the position in bytes. Since the same general rules apply to memory and I/O devices, the eventual plan seems to be to make all I/O operations independent of the details of physical implementation.

The Directory Entry

In both PC-DOS and CP/M, the file directory is a key link between user, program, DOS and data. Because the only normal way to read or write data is through the DOS, and DOS uses the directory as the key to the file area, you can only get at the data through the directory.

The directory entry, then, is the pointer to the file. Along with the part you see when you give a DIR (show directory) command, each directory entry includes the information the DOS needs to figure out where the file's records are located on the disk, along with assorted status information.

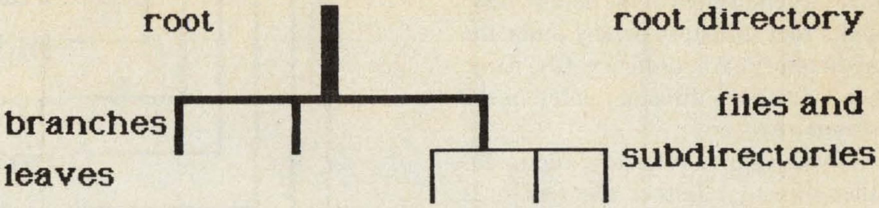


Figure 2. *In a tree-structured directory, the main directory is called the "root," and any of its entries can be the name of a special file that itself is a directory instead of an ordinary data file or program.*

In both CP/M and MS-DOS, the principal directory entry for each file occupies a 32-byte long space on the disk, allowing an even number to fit into sectors that are multiples of 128 bytes long, as shown in Figure 1.

(The original versions of CP/M used a sector length of 128 bytes because that's how data was stored on the single-density eight-inch disk available at the time. Both systems can now use any sector size that is a multiple of 128 bytes. The IBM PC uses 512 bytes per sector.)

In both systems, most of the first half of the entry is occupied by the file name, consisting of up to eight characters of primary name, plus up to three characters of extension (also called "file type"). As a result, you name files according to the same basic rules in both MS-DOS and CP/M.

MS-DOS is also like CP/M in that the console command processor ("COMMAND" in MS-DOS) is much more restrictive about how you can name a file than are the DOS routines themselves. If you name a file through COMMAND, you can't leave a space in the name, all your lower case letters will be translated to upper case, and you won't be able to use about a half dozen symbols and punctuation marks that serve as field delimiters. If you create your files in BASIC or directly through DOS calls from a program that you write, you can bypass most of those restrictions. If you do so, however, you won't be able to erase or type those files from the command level.

Names and Trees

In versions of MS-DOS starting with 2.0, file names get a little bit more complicated. To make it easier to deal with large numbers of files that you might have on a hard disk, MS-DOS allows you to group files in what MS-DOS calls a tree-structured directory. As in most computer "trees," the usual depiction is upside down from what you find in nature, with the root and trunk at the top, branching into limbs and leaves at the bottom (Figure 2).

In the tree-structured directory method, the main directory is called the "root," and any of its entries can be the name of a special file that itself is a directory instead of an ordinary data file or program. Each file entry in this special directory can in turn be a subdirectory name or a program or data. And so on.

Because of this structure, in these MS-DOS versions a simple file name does not always suffice. Just as in CP/M and MS-DOS you have a default disk, and must specify a disk name prefix for a file if you want to refer to a file on another disk, in MS-DOS versions 2 and up there is a default directory and you must specify a more complete description of the file name if you want to refer to a file in another branch or level of the tree.

If you don't establish any subdirectories, MS-DOS will treat your file names just like CP/M does (and as does MS-DOS Version 1). If you don't want to use trees, you don't have to.

Once you create a subdirectory, the

main directory becomes the "root" directory. You then can choose (with commands discussed in the next installment) a "current directory," your directory equivalent of the default disk, as the root directory or any other the subdirectory. An ordinary file name then refers to a directory entry *in the current directory*.

If you want to refer to a file in another directory (either the root or a subdirectory), you have to tell MS-DOS which one you mean. The way you do this is to describe to MS-DOS how to trace down the tree of directories and subdirectories to the directory you want, starting either from your current directory or from the root directory. In MS-DOS, this description is called the "path name," and a path name that starts at the root is a "full path name."

For example, suppose you wanted to keep a disk full of your financial records. Rather than mix everything together, you could establish one subdirectory for an inventory, one for tax information, one for your bank accounts, and so on. Within your tax records, you might have a subdirectory with directory entries for each year. And within the year, one category might be your withholding records.

Your withholding records for 1984 might, in this case, be referred to as:

```
\TAXES\1984\WITHHELD
```

Note the difference between MS-DOS, which allows nesting directories several levels deep, and CP/M, whose user area method only allows for one level of directory categorization. The MS-DOS method also allows for easy access to files that are not in the current directory through the path name description.

Internally, MS-DOS has made another structural change in file names for versions starting with 2.0. Along with the normal file name, and the more complete path names, the system provides a 16-bit "handle" for each file. After the handle is assigned, programs can request DOS operations using these shorter handles instead of the full path names.

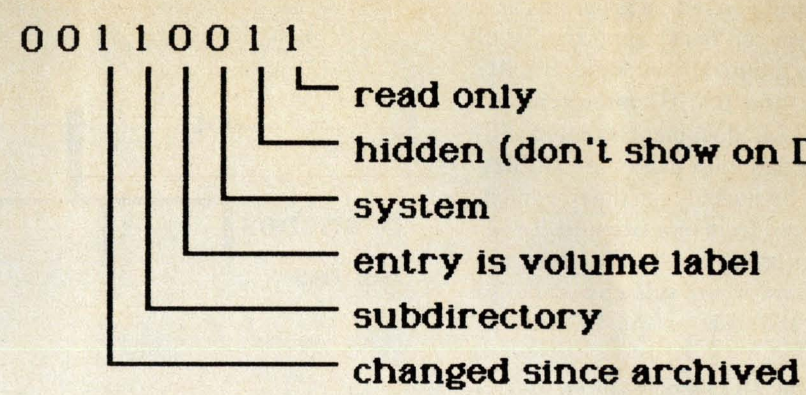


Figure 3 *MS-DOS uses a status byte to mark a file for special treatment.*

File Allocation

In CP/M, each file entry contains both information about the file and a list of areas on the disk containing the file. MS-DOS breaks from CP/M in this respect by including only a *pointer* to a list of where the file is stored, rather than including the list itself in the entry.

This change in how file location information is stored in the directory shows up as several major benefits for the user. First, longer files don't need multiple directory entries in MS-DOS.

In CP/M, each directory entry only has space to map a limited number of areas on the disk. When this map area is filled, the system creates overflow directory entries (each entry is called an "extent"). Because of the exact way formulas for going from maps to track and sector were defined, CP/M files have a maximum size of between 256K and 32 megabytes, depending on the version.

Taking more than one directory entry per file may be a detriment, however, because the total number of available entries on each disk is fixed (at as little as 64 on many systems). Whereas on MS-DOS if you have 64 directory entry positions you can have 64 long files, in CP/M each file could require as many as 16 directory entries, limiting you to as few as 4 files for 64 possible entry positions.

A second advantage of using only pointers instead of maps in the file entries is that in MS-DOS, long files can be read and written without any speed penalty. In CP/M, as each map is exhausted, the system must read a new extent with its new map from the directory area before it can continue with a read or write operation. Because the directory is on one of the first few tracks of the disk while the file can be near the inside, the required trips back and forth can add substantially to file transfer times.

In contrast, the complete map for each disk is kept in memory with MS-DOS systems based on floppy disks. Once a pointer is extracted from a file control block, the system need not refer further to the disk directory to find a file location. On hard disk systems where memory is limited but the map is long (such as the IBM XT), the map is kept partly on disk — but because of the speed of the hard disk the access process is still quite fast.

The separate directory entries and map method used by MS-DOS does, however, have some disadvantages. The most serious is a slight potential decrease in reliability. Just as a distributed computer system can often continue operating when one processor fails, you can often recover most of your files from a CP/M disk with an error in the directory area. In MS-DOS, if you can't read the File Allocation Table (FAT) area of the disk, you've completely lost the chain from directory entry to data sectors. This, supposedly, is one reason that the IBM PC records the table twice on each floppy disk.

Another disadvantage of the File Allocation Table is that the information as recorded in the FAT may not be in agreement with the information as recorded in the directory entries. The two main types of errors are "orphans" and "crosslinks." Orphans are FAT entries that claim an area of the disk for a file, but which no file entry in the directory claims as its own. Crosslinks are FAT entries that belong to different files that both claim the same area of the disk.

In CP/M, every time you newly log-in a disk (and automatically after start-up or a Control-C), the system makes a new allocation table based on the directory entries. The maps in each entry are treated as authoritative, and the allocation map is constructed to reflect the maps. The system, therefore, always has a relatively current file allocation table.

In MS-DOS, it's up to you to make sure the file allocation table is up to date. Microsoft supplies a utility program called CHKDSK for this purpose, and the task is not difficult.

Both systems allocate disk sectors to files on a first-come, first served basis, which may result in files being fragmented across the disk. So in MS-DOS as in CP/M, you can often speed up access to files by copying the disk using a file-copy program (but not with a full-disk copy program since it would retain the current sector arrangement).

Special File Treatment

Like CP/M, MS-DOS allows files to be marked for special treatment, and keeps track of these special status markings in each file's directory entry.

In the earliest versions of CP/M, the only way to specify special treatment for files was to use one of a few reserved file extensions. Naming a file with a ".COM" extension told the system to allow you to invoke that file as a program, and to ignore the control-Z character that was used as an end-of-file marker for text files.

In CP/M 2.0 and beyond, the three high bits of the filename extension are defined as indicating "read-only," "system" and "archived" (backed up), respectively. Read-only files can not be written to, system files are not shown in the normal directory display, and the archive status tells programs such as PIP which files have changed since the last time the disk was backed up.

MS-DOS also has status bits for these purposes, but MS-DOS uses a dedicated byte (figure 3). Strangely, "system" and "hidden" were given separate bits, with either one implying (as does "system" in CP/M) that the file should not appear in a normal directory listing. So far, it seems that all MS-DOS utilities treat the system and hidden attributes as a pair, but you can write programs that distinguish between the two states.

Read-only retains the same meaning in MS-DOS, as does the archive bit (although in MS-DOS a "1" value implies the file has changed, whereas a file change is a "0" in CP/M).

Two of the remaining four bits in the MS-DOS file status byte are used for recording subdirectory status. The bit with an 08H (hexadecimal) value indicates that this entry is a special one for recording the volume name of the root directory. A bit with a 10H value indicates that this entry is a subdirectory with at least one active entry (and therefore cannot be erased).

Although they are not recorded along with the disk, each time a file is opened for use in MS-DOS versions starting with 2.0, you can also specify a more restricted access mode. If the file is not marked read-only by the file's status byte, you can specify that the file should be opened for only reading, only writing, or both reading and writing. So if you get a message from an MS-DOS program telling you that you can only write to a file and not read from it, the message is not necessarily a cruel parody of CP/M's `BDOS ERROR: R/O` message.

Other File Information

One piece of information about files that is conspicuously missing in CP/M is the file length. Because each file can have up to 16 directory entries, and none but the last have any information about the length of the file, it takes some amount of sorting and calculation to figure out the current length of a selected file. MS-DOS takes a more direct route.

Using four bytes from the area freed up by moving the allocation map to the separate file allocation table, MS-DOS keeps track of the current length of each file. With four bytes, the potential size is about 4 gigabytes (4 billion characters), well beyond the size of any mass storage device likely to be used with microcomputers in the near future. But note that even though the file size is reported down to the byte, just like in CP/M file areas are allocated in chunks (with the size of the chunk depending of the machine and disk drives). So while the file size represents the number of bytes passed to MS-DOS to write to that file, it may be somewhat smaller than the area of disk that is used by the file.

At the same time that it made more space in the file length field for large numbers, MS-DOS had to make one more change to prepare for very large storage devices. Along with the map limitation, CP/M also has an implied logical record size of 128 bytes, and a maximum record number of 262,144 (40000 - 1H), resulting in the maximum file size of 32 megabytes. Rather than give up the record-counting routines brought over from CP/M, MS-DOS instead allows you to change the logical record size, and with two bytes to store the value you can choose any value from 1 to 65535 (64K).

Another four bytes of the directory entry in MS-DOS are given over to date and time information (only date was used in versions before 2.0). In a commentary about the falling cost of computation, MS-DOS keeps the time and date each packed into 16-bit integer fields, allowing file creation time to be specified within 2 seconds. CP/M, by contrast, records the time and date stamps in a form that uses more bytes but needs less computation, and only keeps track down to the minute.

Next Installment —
MS-DOS commands

Scenes From Computer Shows

From unbridled enthusiasm to nostalgia and boredom at Softcon in New Orleans and the Ninth West Coast Computer Faire in San Francisco.

by Tony Bove & Cheryl Rhodes

We journeyed to New Orleans in February for the "first" software trade show, called Softcon, held in the Louisiana Superdome. This was purely a business show for dealers and tradespeople and a social gathering for computer people. The attendance was moderate but "well qualified" according to show spokespeople. During Softcon's four days the aisles of the Superdome were never crowded, and at some of the major booths there was little or no activity. The 14,000 attendees were mostly business people interested in computer productivity, dealers from the South and Southwest areas of the country, and computer industry personalities who congregate at every show. In contrast, the Ninth West Coast Computer Faire (WCCF) attracted record crowds (estimated at over 50,000) during its four days. The show was mobbed and our booth sales were high despite the fact that we had solicited many subscribers in several shows in the San Francisco Bay Area in 1983. Our existing subscribers took the opportunity to renew their subscriptions, and many new people subscribed and bought back issues. In both shows the absence of activity at the larger booths was profound. The largest computer manufacturers had trouble drawing crowds, with one exception: Apple had a huge MacIntosh display with on-going demonstrations at both shows that constantly drew crowds. The IBM booths at both shows were noticeably quiet, even though they were introducing the IBM portable computer (the "Compaq killer"). The DEC booth at the WCCF, across the aisle from Apple, was mostly used to contain the overflow crowd watching Apple's demonstration. The large software publishers also had less activity, whereas the upstart vendors with new products had mobbed booths. The smaller booths and "micro-booths" at Softcon were set up around and up the sides of the huge round Superdome, leaving the giant floor to the giant companies. Of course, all the activity occurred in the upper floors on the sides with all the small booths. Even with this activity away from the main floor, some larger companies had booths in rooms on these floors that were never found by many of the show-goers. The Computer Faire was mobbed on every level except the main floor of the Civic Auditorium. Smaller booths (like ours) do well in the subterranean Brooks Hall, which is like a great equalizer in that it makes *all* booths look relatively small. By contrast, our booth last year in Civic was dwarfed by a large computer company booth across the way — IBM. In both shows the feeling was that the large software publishers were showing nothing new, the smaller publishers had some interesting programs, and the IBM PC and Apple MacIntosh were destined to become the new hardware "common denominators."

Most software publishers were showing IBM PC or MS-DOS (PC-compatible) versions of software, and downplaying if not eliminating CP/M versions. There was talk about UNIX coming into the forefront, spurred on by speculation about AT&T's personal computers.

Nearly every software package announced at Softcon ran on an IBM PC, and the big question was whether the package would run on a PC-compatible computer. The second biggest question was *which* compatibles would remain in the running after the coming shakeout. We were lucky enough to see some remarkable PC-compatible computers that may not be around next year (especially portables).

There are numerous predictions for such a shakeout, the most popular one being IBM's plan to introduce a new operating system using more copyrightable ROM than ever before, forcing competitors to make machines that will be less compatible.

The trends were less pronounced in the WCCF atmosphere of retail sales (some booths had glass counters as in

Paul Winternitz

Plenty of activity at the User's Guide booth, where Lon Shoemaker and Karen Boulton handle customers with smiles. They were just told the show would close in one hour.

Paul Winternitz

Timothy Leary plays with the New Wave and Rock template for the MusiCalc program by Waveform Corp., demonstrated by Bill Moulton of Waveform, while Robin Williams and Ted Nelson cracks jokes.

Paul Winternitz

Bill Moulton changes tempo for Timothy Leary at the Waveform booth at the West Coast Computer Faire.

CONFUSED?

Communications Software Can Be a Real Headache. For FAST RELIEF, use COMMX! It's Simple to Operate and Provides the Best Features Available for Both Personal and Business Communications:

- Easy to Use Menu Selections and Prompts
- Auto-Dial-Logon and Unattended Controls
- Dial Directory Handles up to 700 entries
- Install Utility for Intelligent Modems
- Programmable Terminal Emulation!
- Linkup with Information Services like WU Telex, TWX, USPS ECOM, CompuServ, NewsNet (free subscription included)
- Micro to Micro and Micro to Mainframe multiple File Transfer Protocols:
  - Text Upload/Download with Options
  - Text and Binary Upload/Download with proprietary Error-free COMMX protocol mainframe Versions available for VAX, CompuServe, DEC 10, IBM 370, HP3000, PRIME
  - MODEM7 Batch and Single file Send/Recv
- Direct Link High Speed Data Transfers
- Electronic Mail Management Software upgrade Available for Organizations
- InfoWorld Report Card A + + + + Dec 1981

COMMX is priced from $195 (micro CP/M or MS-DOS) to $900 (mainframe). OEM and multiple licenses available.

HAWKEYE GRAFIX

818-348-7909 / 213-634-0733
23914 Mobile, Canoga Park, CA 91307

Circle number 5 on the reader service card.

retail stores, and many other booths were announcing show specials and discounts). The carnival-like atmosphere of the West Coast Computer Faire is traditional; the former promoter would cruise the aisles in roller skates. Timothy Leary fit right into the scene (see photos), as did Robin Williams, playing games and digital music synthesizers, and testing sales psychology programs.

Ted Nelson was there, helping his Xanadu Network along with its partial move to the Silicon Valley area. UNIX supporters had a new slogan (UNIX: Live Free or Die), and the Apple MacIntosh supporters were everywhere, denouncing the lemming-like attitude of software publishers who endorse only IBM PC versions of their software.

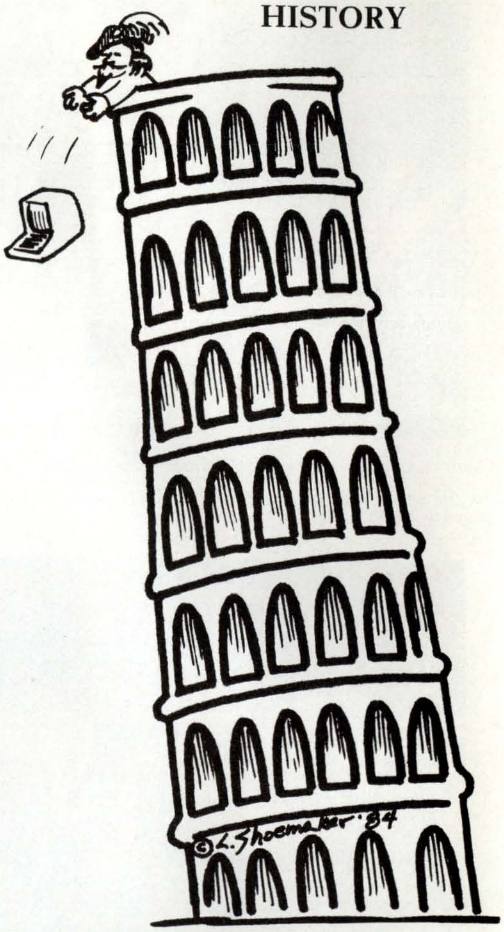
One seemingly obvious question that was hardly whispered was the question of what happened to the *one million CP/M users*, some of whom presumably go to shows. Did they jump on the IBM or Apple bandwagons? Have they suddenly become "vertical markets?" Are they out there managing their businesses and professions using "ancient" CP/M computers that presumably require no support or service?

With tons of software announced to run only on IBM machines, CP/M users may be feeling a bit left out. One magazine dedicated to the CP/M community has already stopped publication. Which others will suffer the same fate?

Computer shows are becoming more like auto shows and boat shows, and perhaps this is the real bankable trend. For the technical and social gatherings that used to occur at the West Coast Computer Faire, you should now check out your local user group and area chapter. User groups at the WCCF recruited thousands of members, most willing to share free advice and practical tips on using personal computers. User groups also know about the best deals (usually at computer flea markets), which are harder to find at large computer shows.

There can be no doubt that the shows are becoming more boring as IBM becomes more dominant in the marketplace. The reason for this is simple: people like to see different hardware products as well as different software products as they walk miles of aisles. Many people like the Mac because it *looks* different. We are hopeful that more computer and software manufacturers will think up ways to makes something interesting happen at these shows.

COMPUTERS THROUGH HISTORY



Galileo experiments with terminal velocity.

WIZARD of OsZ™

A Contact Enterprise

Manufacturers and Publishers of Microcomputer Software

9614C Cozycroft Avenue • Chatsworth, California 91311 • (818) 709-6969

COMMUNICATIONS SOFTWARE

OSBORNE 1
OSBORNE EXECUTIVE
KAYPRO II
ZORBA

Transfer any text, data or program file type. Save all or part to buffer and/or disk. Simple to use. 300 BAUD & 1200 BAUD. Send and receive TELEX worldwide with RCA TELEXTRA™ or ITT Worldwide. Includes: SYS-LINK™, RCPMLINK™, SYSTOSYS™, TLX-LINK™. All for only $99.00

Original package includes PLINK and RCPMLINK (For Osborne 1 or Kaypro II Only). $50.00

Direct Connect MODEM includes SOURCE (sm) subscription from only $79.95

HEAD CLEANING PRODUCTS
ANCHOR MODEMS
RITEMAN PRINTERS
ZORBA COMPUTERS

GAMES

GAMES DISK 4	2D Maze, 3D Maze, Bounce & Lander. Programmed in C Basic.	$50.00
GAMES DISK 5	Play Black Jack, Goldmine, Space War & Wizdot.	$50.00
GAMES DISK 6	Pre-school to college games.	$50.00
KAMAKAZE OZZY/SHOOTOUT	Arcade type action games with moving graphics. Use with or without joystick.	$50.00
JOYSTICK PACKAGE	Includes software with source and intermediate file with Spacewar, Esketch and Goldmine. Text file on disk. Also includes Joystick and adapter cable.	$50.00
	Joystick and adapter cable for Osborne 1 Only.	$29.95

OTHER SOFTWARE

OSBOARD	Electronic drawing board. Create bar graphs, data entry forms, etc.	$34.95
OSGRAPH	Create bar charts (vert./horiz.), pie charts.	$34.95
OSBRIEF	Briefing software. Create slide show using Osboard or Osgraph files.	$24.95
	Or order with Osboard and Osgraph and pay only $15.00 for Osbrief.	
CHEKWIZ	Checkbook software. Handles 1,400 check entries.	$50.00
WIZDEX	Text file indexing software. Generates index for Wordstar.	$50.00
WASH	Directory and file utility. Easier to use than PIP.	$50.00

SEND FOR OUR CATALOG OF ACCESSORIES AS WELL AS INFORMATION ON THE ZORBA COMPUTER.

Circle number 9 on the reader service card.

continued from page 54

scriptions to *ALL* other computer magazines. Yours is the only one I need! Issue #7 was great as I just started using T/Maker III on my Epson QX-10 computer.

Lois Kempley
Montello, WI

I first found your magazine in a Seattle book store last spring (next to the pornographic magazine section!). I was so delighted with the format that I showed it to some of my CP/M buddies. They were so delighted that they took all the subscription cards and I now find that they are subscribers and I'm not! Hmmm.

That opening is a plea for a subscription! If your back issues are still available, please let me know.

David I. Huffman, M.D., INC., P.S.
Longview, WA

Thanks for the subscription. All back issues, including the revised #1 (but not the old #1) are still available. Note back issue advertisement in this issue, page 77.

Suggestions

User's Guide is ideal for embryonic hackers such as I. On this basis I have some suggestions for future issues, more tutorials. The most needed subjects would be DDT/SID, MAC, BLOCK/DEBLOCK, SUBMIT, ASM, etc. Some of these may appear quite elementary, but although I can stumble through DDT or SID, I definitely do not understand them. Assembly language is quite simple in theory, but to make it work in an understandable way is something else. Along with a tutorial on ASM, a course in assembly language would be very helpful.

Peter Nevius
Schenectady, NY

This issue features a tutorial on using DDT to patch programs and do other "elementary" things. Unfortunately an assembly language tutorial is beyond the scope of this magazine. We are providing a tutorial on using ASM in a future issue (theme: amateur programming). We will also cover amateur programming with BASIC, Pascal and other languages.

Ever since *DataCast* folded I've been on the lookout for your address! You are the best writers of instruction and documentation I've read...

William J. Margolis
Venice, CA

I have been following your continuing stories about dBASE II through two issues (#4 and #5). These have been very helpful... The only problem is, in #5 at the end of the article "An Introduction to dBASE II," you state that "in the next issue we will explore the areas of indexing and sorting a data base." Well, I have read issue #6 and there is no mention of any article about dBASE II. Will there be any more articles about dBASE II?

I thank you for your work in putting together a publication with articles that the novice can understand and use. Keep up the good work.

John V. Gregory
Mont Vernon, NH

Sorry, there was an unavoidable delay in supplying the second part of that two-part series on dBASE II. It appears in this issue. We intend to cover dBASE II in several application notes in future issues, possibly one each issue for the next three issues.

The first six issues have included many helpful articles relating to CP/M and WordStar; however, I am interested in learning more about DataStar and ReportStar. Do you expect to include articles about this software in the near future?

Sandra Silva
Sacramento, CA

Yes, we intend to cover the entire InfoStar package from MicroPro International (San Rafael, CA), makers of WordStar, MailMerge and the others mentioned.

Sanyo and Modem7

I read the letter from George Johnson (St. Louis, MO) about his difficulty in procuring the Modem7 program. I have a Sanyo MBC-1000 computer and know that it is difficult to link the Hayes Smartmodem to the machine. I've done it and would be happy to provide any user with a similar configuration with an operational disk.

I have had roughly nine years of experience with CP/M and it still was difficult for me because of the support that the Sanyo organization in the U.S. has provided. Even the Sanyo User's Group in Sacramento has been very slow in providing any assistance despite phone calls, prepaid envelopes, disks send prepaid, etc.

Both my son and I have duplicate Sanyo MBC-1000s and Hayes Smartmodem 1200s. My wife was quick to point out that it took me over a month to get the MDM712 program (one of the more recent versions of Modem7) running correctly on the machine. I still cannot get BYE15 (a public domain program for remote use of your computer by calling it) to run correctly on my son's machine because of the unique implementation of CP/M.

After reading the Sanyo User's Group Newsletter, I feel it is only fair to say that whoever is in charge of customer support at Sanyo should be promptly terminated, and replaced with someone who is familiar with the machine and with CP/M.

(Editor's note: please don't waste Gordon's time — write to him only if you need MDM712 on the Sanyo MBC-1000, and send a formatted or blank disk with postpaid envelope so that Gordon does not have to spend extra to help you. With this type of courtesy in action, perhaps other readers will volunteer such help.)

Gordon French
1105 West Olive #15
Sunnyvale, CA 94086

Perfect Writer Suggestion

Thomas Howe's comparison of Perfect Writer and WordStar (issue #6) helped convince me to purchase a Kaypro II with the bundled Perfect Software package. I was most attracted by Perfect Writer's footnoting capability, a very useful feature in the academic environment.

However, I soon found that Perfect Writer does not support the microfeed capability of the Epson RX-80 printer I now use, and therefore will not properly insert superscripted footnote numbers in the text. This lack of support was confirmed in calls to Kaypro and to Perfect Software. Perfect's technician did hint, however, that a "fix" would be available in the future.

Since the RX-80 is certainly going to be a popular printer with many Kaypro owners, perhaps a discussion of how to properly interface it with Perfect Writer might be a suitable topic for a future article.

Again, many thanks (to Thomas Howe) for your informative articles.

W. A. Gerrard
Raleigh, NC

Proportional Printing

I read with interest T. Howe's article on proportional printing with Perfect Writer (issue #7). I use Perfect Writer almost exclusively, by choice, and have not experienced the seemingly overwhelming difficulty others have with using this program. I was interested in proportional printing for a long time since I've used the Xerox 850 dedicated word processor, and have a Xerox 625 Memorywriter for my secretary.

This letter is being written with Perfect Writer using a Kaypro 10; this format is for correspondence and is thus *not* right justified. I have another format for documents which are right justified. The printer I use is the Dynax DX-15 by Brother with a proportional print wheel. The printer type defined is the Diablo PS; the answers to the printer definitions are slightly different than that presented by Mr. Howe.

When I tried a proportional print wheel with the Dynax, I wasn't sure what would happen; with WordStar, there is microspacing which is not the same thing. To my surprise, I got... well, the text of this letter should be evidence enough!

Charles L. Lum Kee, S.M.
Chaminade Univ. of Honolulu
Honolulu, HI

We vouch for his success. The letter was perfect.

Let me add my voice to the many others singing your praise. I have every issue from your first (and even a couple of issues of *DataCast*) and look forward to each issue!

Please do consider adding features on Modem7 or similar programs relating to practical suggestions as to how to configure communications programs for specific situations. I have a problem adjusting word length, number of stop bits, parity, etc. for my computer to match those required by certain mainframes. I realize that there are many, many computers and that permutations are large, but you might consider giving one practical tutorial based on a specific micro (not the PC!) and a specific mainframe (not The Source!) to show what one needs to consider.

My real reason for writing is to comment on WordStar, Perfect Writer and proportional spacing. In your editorial comment on Thomas Howe's article in #6 you say, "There are times when we wished we had true proportional spacing (in WordStar)," and Thomas Howe says in #7, "It (Perfect Writer) can print... proportionally spaced — something WordStar cannot do." My only experience with Perfect Writer is to convert a file for use with WordStar (your tips are wonderful), but I have some experience with proportional spacing with WordStar and you *can* do it! It is not particularly hard to do; much simpler than the horrendous procedure Howe outlines for Perfect Writer.

To illustrate my point, this paragraph is proportionally spaced on a Morrow MP100 printer — a printer that does *not* have the smarts in its ROM to do proportional spacing. All the work of proportional spacing is done by WordStar. All I did to get it to work was to enter Control-*PP* at the beginning of the paragraph, change the character width to ten, and change the right margin to 72 rather than 60. It apparently will work with any printer that is capable of small horizontal movements (like 1/120"). I have also done proportional spacing on a Daisywriter printer that is capable of 2/120" horizontal movement, but the results are less nice.

The proportional spacing is not optimal. First, I did not use a daisy wheel specially designed for proportional spacing. Second, the PS table in WordStar is not optimal for this particular printer (the Daisywriter seems particularly bad because it can only move in 2/120" increments). Third, there is a defect in the WordStar proportional spacing that may also be present in Perfect Writer (it is difficult to tell from Howe's article) in that the choice of the number of *words* on a line is based entirely on a count of characters and words without regard to the widths of individual characters on the line. Thus, a line with a lot of upper case characters will look terribly crowded and one with a lot of "i"s and "j"s will look a bit sparse.

I don't know why the news about WordStar's proportional spacing hasn't spread further. It is true that it isn't documented by MicroPro except in the Customization Notes, but there is an excellent little book that tells you how (*Proportional Spacing in WordStar*, $20, Writing Consultants, 11 Creek Bend Dr., Fairport, NY), and our user group has a beautiful presentation on the subject by Dr. George Woo of San Francisco State Univ. (Bay Area Micro Decision User's Assoc., PO Box 501, Berkeley, CA 94704).

Frank Oechsli
Berkeley, CA

The proportionally-printed letter from Charles L. Lum Kee looked better (Perfect Writer on a Kaypro printing on a Brother Dynax DX-15) than the paragraph submitted with this letter (WordStar on a Morrow MP100 printer). However, there are many other reasons for using a word processing program. Perfect Writer's proportional printing seems to be excellent, and WordStar's proportional output seems to be fine for most proportional printing needs.

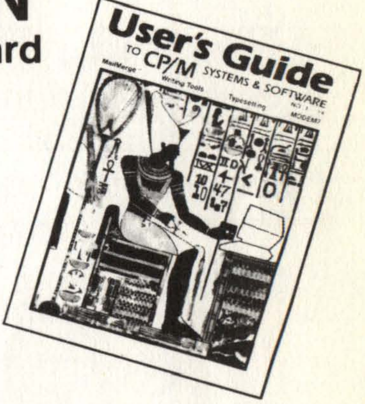
No Postage
Necessary
if mailed
in the U.S.

BUSINESS REPLY CARD
FIRST CLASS PERMIT #36 REDWOOD CITY, CA

POSTAGE WILL BE PAID BY ADDRESSEE

User's Guide
PO Box 5245
Redwood City, CA 94063

FREE INFORMATION
User's Guide Reader Service Card



Here is an easy way for you to get manufacturers' information about products advertised or mentioned. Circle the numbers on the card that correspond to key numbers at bottom of advertisements and fill out and mail the postage paid card and the literature will be sent to you free of charge.

No Postage
Necessary
if mailed
in the U.S.

BUSINESS REPLY CARD
FIRST CLASS PERMIT #36 REDWOOD CITY, CA

POSTAGE WILL BE PAID BY ADDRESSEE

User's Guide
PO Box 5245
Redwood City, CA 94063

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25
26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50
51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75
76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

Please complete:
Are you a subscriber? ☐ Yes ☐ No

A. Your computer experience?
1.☐ Novice
2.☐ Semi-intermediate
3.☐ Intermediate-advanced
4.☐ Advanced

B. Occupation?
1.☐ Executive/manager
2.☐ Small bus. owner
3.☐ Professional
4. ☐ Other

C. Use which computer(s)?
a. ☐ Apple
c. ☐ CompuPro
e. ☐ Osborne
g. ☐ Radio Shack
i. ☐ TeleVideo
k. ☐ Kaypro
m. ☐ Morrow
o. ☐ ____________
b. ☐ IBM PC
d. ☐ DEC
f. ☐ S-100
h. ☐ Heath/Zenith
j. ☐ Sanyo
l. ☐ Compaq
n. ☐ Columbia
p. ☐ PC-compat.

D. Interested in which software?
a. ☐ Word processing
c. ☐ Communications
e. ☐ Medical/Dental
g. ☐ Other vertical
b. ☐ Accounting
d. ☐ Data base mgmt.
f. ☐ Financial planning
h. ☐ Scientific

E. Interested in which products?
a. ☐ Printers
c. ☐ Hard disks
e. ☐ Information services
b. ☐ Modems
d. ☐ Publications
f. Other: ____________

F. Where do you use your computer?
1. ☐ Small business
2. ☐ Profession
3. ☐ School/training
4. ☐ Construction
5. ☐ Medium business
6. ☐ Home
7. ☐ Corporation
8. Other: ____________

G. Your immediate need?
1. ☐ Adding peripherals to present system
2. ☐ Upgrading system performance
3. ☐ Using information/communications services
4. ☐ Supplies and accessories

Name ____________ Age ______ Sex ______
Company ____________ Title ____________
Address ____________ City, State, Zip ____________

UG 8

Respond Now
Free Information About Software, Personal Computer Systems, and Peripheral Equipment.

Here is an easy way for you to get further information about products advertised or mentioned. Circle the numbers on the card that correspond to key numbers at the bottom of advertisements and product announcements. Fill out and mail the postage paid card and literature will be sent to you free of charge.

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25
26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50
51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75
76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

Please complete:
Are you a subscriber? ☐ Yes ☐ No

A. Your computer experience?
1.☐ Novice
2.☐ Semi-intermediate
3.☐ Intermediate-advanced
4.☐ Advanced

B. Occupation?
1.☐ Executive/manager
2.☐ Small bus. owner
3.☐ Professional
4. ☐ Other

C. Use which computer(s)?
a. ☐ Apple
c. ☐ CompuPro
e. ☐ Osborne
g. ☐ Radio Shack
i. ☐ TeleVideo
k. ☐ Kaypro
m. ☐ Morrow
o. ☐ ____________
b. ☐ IBM PC
d. ☐ DEC
f. ☐ S-100
h. ☐ Heath/Zenith
j. ☐ Sanyo
l. ☐ Compaq
n. ☐ Columbia
p. ☐ PC-compat.

D. Interested in which software?
a. ☐ Word processing
c. ☐ Communications
e. ☐ Medical/Dental
g. ☐ Other vertical
b. ☐ Accounting
d. ☐ Data base mgmt.
f. ☐ Financial planning
h. ☐ Scientific

E. Interested in which products?
a. ☐ Printers
c. ☐ Hard disks
e. ☐ Information services
b. ☐ Modems
d. ☐ Publications
f. Other: ____________

F. Where do you use your computer?
1. ☐ Small business
2. ☐ Profession
3. ☐ School/training
4. ☐ Construction
5. ☐ Medium business
6. ☐ Home
7. ☐ Corporation
8. Other: ____________

G. Your immediate need?
1. ☐ Adding peripherals to present system
2. ☐ Upgrading system performance
3. ☐ Using information/communications services
4. ☐ Supplies and accessories

Name ____________ Age ______ Sex ______
Company ____________ Title ____________
Address ____________ City, State, Zip ____________

UG 8

Please enroll me at the low introductory offer
CHECK ONE:
☐ Send me six issues for $18, payment is enclosed, or
☐ Bill me for six issues at $21, or
☐ Send me twelve issues for $34, payment is enclosed, or
☐ Bill me for twelve issues at $40, or
☐ Foreign rates, payment enclosed: Canada & Mexico $22/six issues, overseas $40/six issues (airmail).

Payment by charge card: ☐ Visa ☐ Mastercard

Signature required: ______________________ Exp. date _____ MC ___

Card # ______________________________

TOTAL ORDER: $ _______

Name ______________________________

Company ________________ Title ________________

Address ______________________________

City, State, Zip ______________________________
☐ Check if you do not want promotional mailings.

Make checks payable to: User's Guide, Offer expires 12/31/85
Subscription Dept.: P.O. Box 5245, Redwood City, CA 94063.
Please allow 6-8 weeks for processing.

UG 8

SAVE 25% off newsstand price

Please enroll me at the low introductory offer
CHECK ONE:
☐ Send me six issues for $18, payment is enclosed, or
☐ Bill me for six issues at $21, or
☐ Send me twelve issues for $34, payment is enclosed, or
☐ Bill me for twelve issues at $40, or
☐ Foreign rates, payment enclosed: Canada & Mexico $22/six issues, overseas $40/six issues (airmail).

Payment by charge card: ☐ Visa ☐ Mastercard

Signature required: ______________________ Exp. date _____ MC ___

Card # ______________________________

TOTAL ORDER: $ _______

Name ______________________________

Company ________________ Title ________________

Address ______________________________

City, State, Zip ______________________________
☐ Check if you do not want promotional mailings.

Make checks payable to: User's Guide, Offer expires 12/31/85
Subscription Dept.: P.O. Box 5245, Redwood City, CA 94063.
Please allow 6-8 weeks for processing.

UG 8

Please enroll me at the low introductory offer
CHECK ONE:
☐ Send me six issues for $18, payment is enclosed, or
☐ Bill me for six issues at $21, or
☐ Send me twelve issues for $34, payment is enclosed, or
☐ Bill me for twelve issues at $40, or
☐ Foreign rates, payment enclosed: Canada & Mexico $22/six issues, overseas $40/six issues (airmail).

Payment by charge card: ☐ Visa ☐ Mastercard

Signature required: ______________________ Exp. date _____ MC ___

Card # ______________________________

TOTAL ORDER: $ _______

Name ______________________________

Company ________________ Title ________________

Address ______________________________

City, State, Zip ______________________________
☐ Check if you do not want promotional mailings.

Make checks payable to: User's Guide, Offer expires 12/31/85
Subscription Dept.: P.O. Box 5245, Redwood City, CA 94063.
Please allow 6-8 weeks for processing.

UG 8

Subscribe Now

No Postage
Necessary
if mailed
in the U.S.

BUSINESS REPLY CARD
FIRST CLASS PERMIT #36 REDWOOD CITY, CA

POSTAGE WILL BE PAID BY ADDRESSEE

User's Guide
PO Box 5245
Redwood City, CA 94063

Billing Address:

No Postage
Necessary
if mailed
in the U.S.

BUSINESS REPLY CARD
FIRST CLASS PERMIT #36 REDWOOD CITY, CA

POSTAGE WILL BE PAID BY ADDRESSEE

User's Guide
PO Box 5245
Redwood City, CA 94063

Billing Address:

No Postage
Necessary
if mailed
in the U.S.

BUSINESS REPLY CARD
FIRST CLASS PERMIT #36 REDWOOD CITY, CA

POSTAGE WILL BE PAID BY ADDRESSEE

User's Guide
PO Box 5245
Redwood City, CA 94063

Please send me the following back issues:

Payment by charge card: ☐ Visa ☐ Mastercard   Payment must accompany order.

Signature required: ______________ Exp. date __________ MC __________

Card # ______________________________

☐ CP/M Summary Card, $2 each: # of cards ______________ = $__________

☐ Back issue #3, #4, #5 or #6 at $4 each ($5.50 first class or foreign surface, $10 foreign airmail), or #2 at $6 each ($7.50 first class or foreign surface, $12 airmail):

Issue# **1** Qty. ______________ at $5 each ($6.50 1stC or foreign, $11 air) = $__________

Issue# **2** Qty. ______________ at $6 each ($7.50 1stC or foreign, $12 air) = $__________

Issue# ___ Qty. ______________ at $4 each ($5.50 1stC or foreign, $10 air) = $__________

TOTAL ORDER: $__________

Name ______________________________

Company ______________ Title ______________

Address ______________________________

City, State, Zip ______________________________

☐ Check if you do not want promotional mailings.

Make checks payable to: User's Guide, Offer expires 12/31/85
Subscription Dept.: P.O. Box 5245, Redwood City, CA 94063.
Please allow 6-8 weeks for processing.

Billing Address:

No Postage
Necessary
if mailed
in the U.S.

BUSINESS REPLY CARD
FIRST CLASS PERMIT #36 REDWOOD CITY, CA

POSTAGE WILL BE PAID BY ADDRESSEE

User's Guide
PO Box 5245
Redwood City, CA 94063

Back Issues

Here are just a few reasons why these issues are so popular:

User's Guide
TO SYSTEMS & SOFTWARE
NO. 5 $4
CP/M Plus Tutorial
dBASE II Tutorial
Perfect Filer
Radio Shack Model 100
PMC MicroMate
TeleVideo & WordStar
Hard Disks

Please send me the following back issues:

Payment by charge card: ☐ Visa ☐ Mastercard Payment must accompany order.

Signature required: ____________________ Exp. date __________ MC ________

Card # ____

☐ CP/M Summary Card, $2 each: # of cards ______________ = $ __________

☐ Back issue #3, #4, #5 or #6 at $4 each ($5.50 first class or foreign surface, $10 foreign airmail), or #2 at $6 each ($7.50 first class or foreign surface, $12 airmail):

Issue# **1** Qty. ____________ at $5 each ($6.50 1stC or foreign, $11 air) = $ __________

Issue# **2** Qty. ____________ at $6 each ($7.50 1stC or foreign, $12 air) = $ __________

Issue# ___ Qty. ____________ at $4 each ($5.50 1stC or foreign, $10 air) = $ __________

TOTAL ORDER: $ __________

Name ____

Company ____________________ Title ____________________

Address ____

City, State, Zip ______________________________________

☐ Check if you do not want promotional mailings.

Make checks payable to: User's Guide, Offer expires 12/31/85
Subscription Dept.: P.O. Box 5245, Redwood City, CA 94063.
Please allow 6-8 weeks for processing.

UG 8

Issue #1: CP/M®

Learning to Use CP/M • Impatient User's Guide® to CP/M • Using CompuServe® • Preventing Computer Disasters

Issue #2: WordStar® & SuperCalc®

A Guide to Using WordStar • Impatient User's Guide to WordStar • WordStar Installation Guide • A Guide to Using SuperCalc • Disk Doctor: The Rx For Bad Disks • For Starters: Word Processing & Spreadsheets

Issue #3: MailMerge & Modem7

MailMerge: WordStar's Printing Robot • Impatient User's Guide to MailMerge • Using DocuMate Plus and The Word Plus • Using Footnote and Bibliography • Modem7 Tutorial and RCPM List • WordStar File and Print Summary • For Starters: Word Processing Power

Issue #4: CP/M Plus

Overview of CP/M Plus • Guide to SuperCalc (Pt. 2) • SuperCalc SuperSummary • CP/M Plus Operating Tools • Reference Guide to DU (Disk Utility) • Overview of Floppy Disks • System Overview: CompuPro 8:16 • For Starters: Exploring dBASE II

Issue #5: dBASE II

Introduction to dBASE II • dBASE II Application: Subscription Fulfillment • Perfect Filer Overview & Starter • Using CP/M Plus (Pt. 1) • CP/M Plus: Inner Workings • Hard Disks For Small Computers • WordStar on the TeleVideo 950 • System Overviews: Radio Shack Model 100, PMC MicroMate

Issue #6: Communications

CompuServe Electronic Mail • CompuServe Public Access & File Transfers • Communications Programs: COMMX and MITE • Guide to Using WordStar (Pt. 2) • Converting From Perfect Writer to WordStar • WordStar vs. Perfect Writer • CP+ and Organizer: Menus for CP/M • Cache/Q: A System Enhancer • Glossary of Computer Communications Terms • For Starters: Communications

Issue #7: T/Maker III & CP/M Plus

T/Maker III: Integrated Text Processor, Spreadsheet and Table Maker • Using CP/M Plus, Pt. 2: Utilities For Automation • FILEBASE for Personal Computers • Proportional Printing With Perfect Writer • MS-DOS and PC-DOS Overview, Pt. 1 • Making Communications Connections • For Starters: Brief Tour of CP/M Systems • System Overview: DEC Rainbow • Annual Index for issues 1-6

HERE TODAY HERE TOMORROW

When buying a computer, you can't limit yourself to just satisfying today's needs. **The best value in a system comes from its productivity . . . both for today and tomorrow.** CompuPro's System 816™ computer has that value. With all the power and capacity to handle your needs now and down the road.

System 816's longevity stems from top quality components . . . high storage capacity . . . the flexibility to handle a large variety of applications . . . and the speed to get the job done fast. Upgrading is easy, and when it's time to expand from single to multi-user operation, it's as simple as plugging in boards and adding terminals. Your system grows as you grow.

CompuPro also provides a library of the most popular software programs with your system and because it's CP/M® based, you have more than 3,000 other programs to choose from.

Even our warranty is for today and tomorrow. It spans 365 days — and includes the additional security of Xerox Americare™ on-site service nationwide for designated systems.

What's more, CompuPro is one company you can count on to be around tomorrow. For more than ten years we've been setting industry standards, increasing productivity and solving problems.

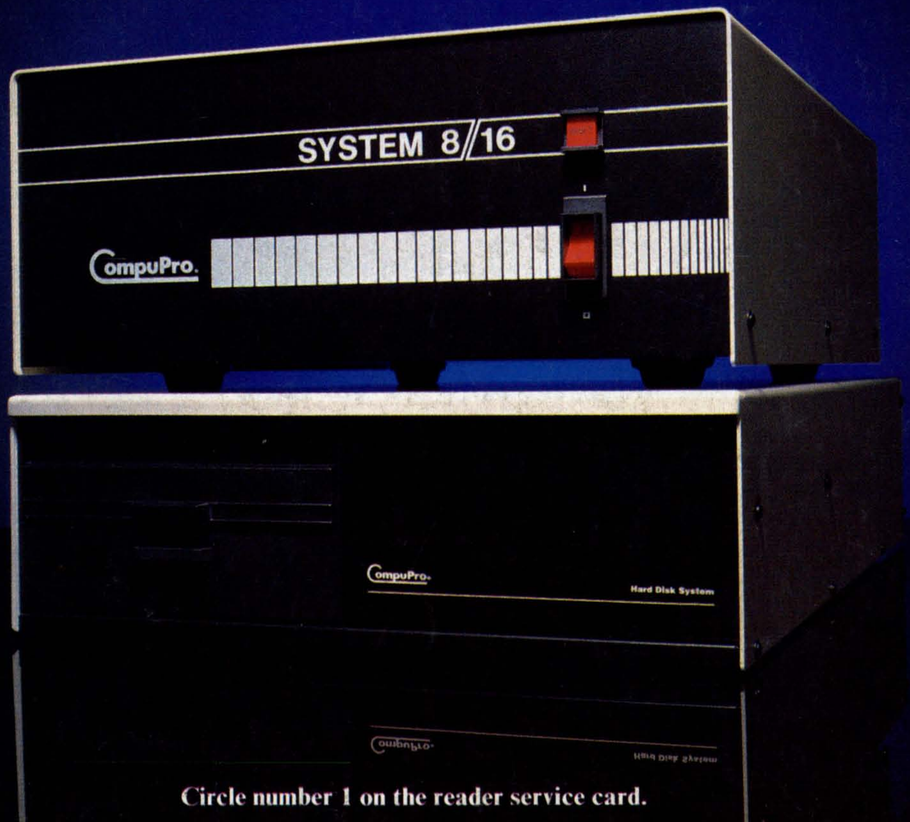
For a free copy of our business computer buyer's primer, and the location of the Full Service CompuPro System Center nearest you, call **(415) 786-0909 ext. 206.**

CompuPro's System 816. The computer that's just as essential tomorrow as it is today.

CompuPro®
A *GODBOUT* COMPANY
3506 Breakwater Court, Hayward, CA 94545

System 816 and The Essential Computer are trademarks of CompuPro. CP/M is a registered trademark of Digital Research Inc. Americare is a trademark of Xerox Corporation.
System 816 front panel design shown is available from Full Service CompuPro System Centers only.

The Essential Computer™



Circle number 1 on the reader service card.